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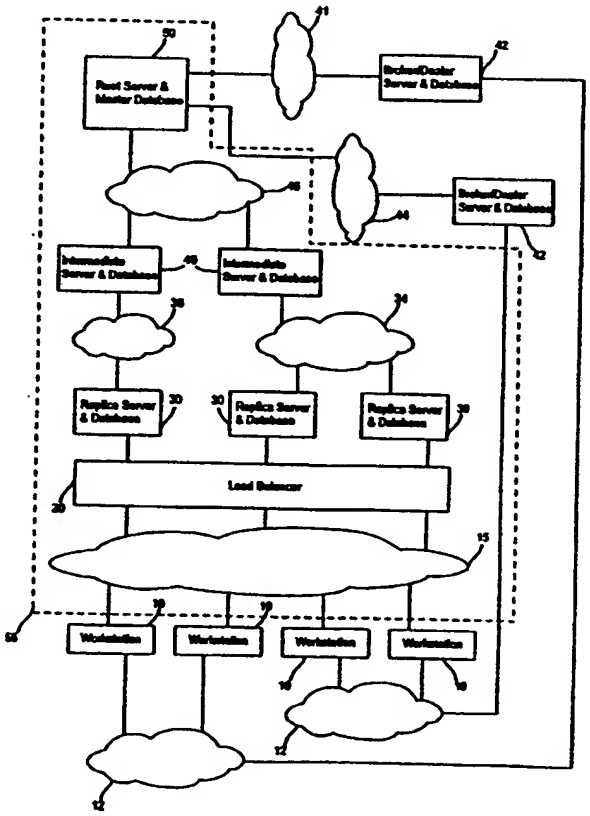
(54) Title: A SYSTEM AND METHOD FOR CONDUCTING SECURITIES TRANSACTIONS OVER A COMPUTER NETWORK

(57) Abstract

The system and method of the preferred embodiment supports trading of securities over the Internet both on national exchanges and outside the national exchanges. In a preferred embodiment, users are subscribers to a securities trading service offered over the Internet. Preferably, each subscriber to this service is simultaneously connected from his own computer to a first system which provides user–to–user trading capabilities and to a second system which is a broker/dealer (42) system of his/her choice. The system providing the user–to–user trading services preferably includes a root server (50) and a hierarchical network of replicated servers supporting replicated databases. The user–to–user system provides real–time continuously updated stock information and facilitates user–to–user trades that have been approved by the broker/dealer systems with which it interacts.



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A SYSTEM AND METHOD FOR CONDUCTING SECURITIES TRANSACTIONS OVER A COMPUTER NETWORK

FIELD OF THE INVENTION

This invention relates to computer-aided trading of financial instruments, and preferably to trading of securities over the Internet.

BACKGROUND OF THE INVENTION

In the United States, the trading of securities is closely regulated under the Securities Exchange Act of 1934, 15 U.S.C. §§ 78a-78mm. The term "security" is defined in 15 U.S.C. § 78c(a)(10) as "any note, stock, treasury stock, bond, debenture, certificate of interest or participation in any profit-sharing agreement or in any oil, gas, or other mineral royalty or lease, any collateral-trust certificate, preorganization certificate or subscription, transferable share, investment contract, voting-trust certificate, certificate of deposit, for a security, any put, call, straddle, option, or privilege on any security, certificate of deposit, or group or index of securities (including any interest therein or based on the value thereof), or any put, call, straddle, option, or privilege entered into on a national securities exchange relating to foreign currency, or in general, any instrument commonly known as a 'security'; or any certificate of interest or participation in, temporary or interim certificate for, or warrant or right to subscribe to or purchase, any of the foregoing . . . but shall not include currency or any note draft, bill of exchange, or banker's acceptance which has a maturity at the time of issuance of not exceeding nine months, exclusive of days of grace, or any renewal thereof the maturity of which is likewise limited." Stocks are specific instances of securities. Although the preferred embodiment is primarily concerned with computerized stock trading, it is fully applicable to trading of any securities.

Securities are conventionally traded on exchanges. As set forth in 15 U.S.C. § 78c(a)(1), "the term 'exchange' means any organization, association, or group of persons, whether incorporated or unincorporated, which constitutes, maintains, or provides a market place or facilities for bringing together purchasers and sellers of securities or for otherwise performing with respect to securities the functions commonly performed by a stock exchange as that term is generally understood, and includes the market place and the market facilities maintained by such exchange". Well known exchanges include, for example, the New York Stock Exchange, the American Stock Exchange and NASDAQ. Such known exchanges are referred to herein as national exchanges.

Usually securities are traded through brokers and dealers, which frequently use an on-line system to receive orders and facilitate trades. As set forth in 17 C.F.R. § 240.17a-23(b)(2) a broker/dealer trading system is "any facility that provides a mechanism, automated in full or in part, for:

(i) Collecting, receiving, disseminating, or displaying system orders [i.e., orders to purchase or sell a security]; and

(ii) Matching, crossing, or executing system orders, or otherwise facilitating agreement to the basic terms of a purchase or sale of a security between system participants [i.e., the users of the trading system], or between a system participant and the system sponsor, through use of the system or through the system sponsor [i.e., the entity controlling the broker/dealer system]."

In this patent application, the terms "security", "exchange" and "broker/dealer trading system", are used as defined above.

Systems are known for trading securities over the Internet on the national exchanges at the prices quoted on those exchanges. These systems support trading during normal

business hours of the national exchanges, which may not be convenient for many users, such as many individuals who would prefer to trade from home after the close of the exchanges. The existing systems, however, do not support active trading after the closing hours of the exchanges. Thus, there is a need for a system that permits the users to execute trades after normal market hours (after-hours trades) without using an established exchange. And, there is a need for a system that permits users to trade with each other ("user-to-user trading") without involving an exchange.

The presently available systems are directed toward the presentation of numerically formatted information. Moreover, these systems do not provide a visualization of the status of securities as they are traded so as to enable users to gain an essentially immediate and accurate impression of a stock's status, direction of movement, and rate of change, without having to resort to complex mental calculations and holding such calculations in short-term memory. But humans are unsuited to processing numeric information quickly and accurately, and performing mental calculations under stressful conditions places very high cognitive workloads on humans. In addition to being poor processors of numeric information, humans also tend to have very weak short-term memories. Requiring users to perform mental calculations and then hold the results of those calculations in short-term memory while performing even more calculations is unnecessarily difficult and demanding, especially when users are placed under the additional stress of having to decide whether to buy, sell or hold a stock. Traditional on-line trading systems further compound the problem by requiring users to navigate from page to page within the site to gather news and information on their positions, their profit and loss, their open orders, their current positions, and their financial account information. Each time a user moves to a new screen he is forced to store values, which are critical to informed trade-decision-making, in short-term memory.

Another deficiency in current Internet trading systems is that users cannot obtain a real-time quotation on a particular stock (or a portfolio of stocks) without manually requesting a specific quotation from the trading system server, often by typing it every time they need a quote, or hitting "refresh." That is, users of current Internet trading systems cannot simply access the trading system and receive a continuously updated display of real-time quotes for a particular stock or a portfolio of stocks. The need to type in a stock symbol every time a quote is desired further contributes to the inefficiency of the existing systems.

Accordingly, there is a need for an efficient Internet-based trading system which provides improved human interaction and after-hours trading.

SUMMARY OF THE INVENTION

The system and method of the preferred embodiment supports trading of securities over the Internet both on national exchanges and outside the national exchanges. The preferred embodiment also supports an improved human interface and a continuous display of real-time stock quotes on the user's computer screen.

In the preferred embodiment, the users are subscribers to a securities trading service offered over the Internet. Each subscriber to this service is simultaneously connected from his own computer to a first system which provides user-to-user trading capabilities and to a second system which is a broker/dealer system of his/her choices. By user-to-user trading we mean a trade that is made between two users of the system. The system providing the user-to-user trading services includes a hierarchical network of replicated servers supporting replicated databases. The broker/dealer system is a server-based system such as any one of the systems currently used by broker/dealers to maintain their clients' accounts. The use of these broker/dealer systems in the present invention is conventional except for their

interaction with the user-to-user trading system. In particular, each broker/dealer server communicates with the user's computer as well as with the root server of the user-to-user system when the user's account is affected, and the user-to-user system provides real-time continuously updated stock information and facilitates user-to-user trades that have been approved by the broker/dealer systems with which it interacts.

Users of the preferred system can trade securities with other users of the system after national market trading hours. As part of this user-to-user trading, a user can accept a buy or sell offer at the terms offered or he can initiate a counteroffer and negotiate a trade. This ability to have users trade and negotiate trades among themselves creates a market within the subject system, referred to herein as "after-hours market" or "Nite Market," but which is capable being operated 24 hours per day, 7 days per week.

The preferred embodiment provides an ergonomic graphical user interface (GUI) that includes at least some of the following functional benefits in comparison with existing on-line consumer trading systems: (1) faster access to critical information; (2) faster execution of primary trading functions; (3) better decision making during the trading process; (4) fewer undetected critical errors; (5) easier correction of detected errors; (6) faster and more reliable problem resolution; (7) improved use of each user/trader's desktop workspace; (8) easier customization and configuration based on user experience; (9) easier and faster initial setup of each user's securities on the system; and (10) faster and more stable acquisition of trading skills. The GUI of the preferred embodiment graphically displays a "visual quote" that shows at a glance the condition of the market in a security and the user's relative position based on the status of the security in the marketplace. This visual quote provides a graphic representation of the important variables that the user needs to make accurate trading decisions without interpreting traditional numeric quotes. Further, the GUI of the preferred

embodiment, unlike other on-line trading interfaces, does not require users to page to a separate screen to view their current and open positions in a security, thereby reducing errors and short-term memory demands on the user and improving the quality of on-line trading. The preferred embodiment also provides speed-trading functions as well as visual feedback that tracks the progress of the security trading process.

Although the preferred embodiment described below relates to computerized stock trading, it is readily applicable to trading of any securities and, in addition, a person skilled in the art will readily appreciate how the disclosed technology can be used for other forms of computerized trading (e.g., trading airline tickets, automobiles, or theater tickets).

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects, features and advantages of the invention will be more readily apparent from the following detailed description of a preferred embodiment of the invention in which:

FIG. 1 illustrates a communications system of the preferred embodiment.

FIG. 2 illustrates an alternative embodiment.

FIG. 3 is a flow diagram illustrating the operation of the preferred system for the user-to-user trades.

FIG. 4 illustrates how the alternative embodiment illustrated in **FIG. 2** enables the real-time updating and transmission of information.

FIG. 5 illustrates a graphical user interface (GUI) of the preferred embodiment.

FIG. 6 depicts a visual quote and order book display.

FIG. 7 depicts an open orders display.

FIG. 8 depicts a current positions display.

FIG. 9 depicts a financial summary display.

FIG. 10 is a news and information display.

FIG. 11 is a trade ticket display.

FIG. 12 is a stock summary display.

FIG. 13 is a multiple pricing maps display.

FIG. 14 depicts a real-time chart of stock activity.

FIG. 15 is a function button display.

FIG. 16 is an illustration of four different views available through expanding and shrinking the master trade screen.

FIG. 17 is a flow diagram illustrating software that enables a user to obtain and install the graphical user interface (GUI) software of the preferred embodiment and open a new account.

FIG. 18 is a flow diagram illustrating logging onto the system and visualizing the stock market in the alternate embodiment described in **FIG. 3**.

FIG. 19 is a flow diagram illustrating software of the preferred embodiment which enables a user to view trading and account information on one screen and facilitates fast and accurate trading of stocks.

FIG. 20 is a flow diagram illustrating software of the preferred embodiment which enables a user to visualize the detailed market in other stocks with one action.

FIG. 21 is a flow diagram illustrating software of the preferred embodiment which enables a user to execute a buy order in a stock.

FIG. 22 is a flow diagram illustrating software which enables a user to execute a sell order in a stock.

FIG. 23 is a flow diagram illustrating software which enables a user to execute a change order in a stock purchase already entered into the system.

FIG. 24 is a flow diagram illustrating software which enables a user to execute a cancel order for a stock purchase already entered into the system.

FIG. 25 is a flow diagram illustrating the computer steps by which a user negotiates for a better price in a stock shown in the after-hours stock market of the preferred embodiment.

FIG. 26 is a flow diagram illustrating software supporting the context-sensitive "Help" function of the preferred embodiment.

FIG. 27 is a flow diagram illustrating software which enables a user to view several instances of the order books of the after-hours market on one screen.

FIG. 28 is a flow diagram illustrating the computer steps required for compressing the view of the master trade screen of the GUI of the preferred embodiment.

FIG. 29 is a flow diagram illustrating the computer steps required to expand the display of the GUI of the preferred embodiment to obtain a full view of the master trade screen.

FIG. 30 is a flow diagram illustrating the software of the preferred embodiment for alerting a user to movements on stocks according to user-defined preferences.

FIG. 31 is a flow diagram illustrating how the preferred embodiment enables a user to visualize the general status of stocks and related positions via an analog graphic display.

FIG. 32 is a flow diagram illustrating how the preferred embodiment enables a user to visualize the best price in a security from an analog graphic display of alternate markets.

FIG. 33 is a flow diagram illustrating the operation of the news gathering and distribution system of the preferred embodiment.

FIG. 34 is a flow diagram illustrating software which enables a user to view the status of his open orders in a stock.

FIG. 35 is a flow diagram of software which enables a user to view the status of positions and profit and loss information (P&L).

FIG. 36 is a flow diagram illustrating software which enables a user to view the status of his account history.

FIG. 37 is a flow diagram illustrating software which enables a user to view the status of his account balances.

FIG. 38 is a flow diagram illustrating software which enables a user to receive and view email messages for account activity functions.

FIG. 39 is a flow diagram illustrating software which enables a user to view and select the best price for the same stock sold in several markets.

FIG. 40 is a flow diagram illustrating software which enables a user to view the market in a stock by accessing the visual quote and providing visual display of stock performance.

FIG. 41 is a "Set defaults" display for the user-to-user negotiation mechanism of the preferred embodiment.

FIG. 42 is a negotiations screen.

FIG. 43 illustrates how the negotiation screen fits into the master trade screen.

FIG. 44 illustrates how a user adjusts the values in his counteroffer.

FIG. 45 illustrates how the application displays the potential effect of a user's counteroffer.

FIG. 46 illustrates how an offering trader responds to a user's counteroffer.

FIG. 47 illustrates how a user makes an offer to sell and then receives buy counteroffers.

FIG. 48 illustrates how the preferred embodiment enables a user to conduct more than one in-coming negotiation and more than one out-going negotiation simultaneously.

FIGS. 48A and **48B** show a flow diagram illustrating how the system enables one user to negotiate with another user.

FIG. 49 is a "Most viewed stocks" display.

FIG. 50 is a fully compressed view of the GUI of the application (see **FIG. 16**).

FIG. 51 shows a "Quick Quote" display.

FIG. 52 shows a "Stock alert set up" display.

FIG. 53 shows a connection status indication display.

FIG. 54 shows a compressed spread display.

FIG. 55 shows an email display.

FIG. 56 shows a "Final Verification" screen.

FIG. 57 shows an analog graphic display for viewing the price of a stock on several markets at one time.

FIG. 57A is a "Most Active Stocks" display.

FIG. 57B shows how the most viewed stocks display shown in **FIG. 49** is displayed in the same screen as the Order book display, chart display, and most active stocks display.

FIG. 57C shows a multi-screen view created by a "Peel off display" function.

FIG. 58 shows an applet version of the display of a real-time chart of the stock activity shown in **FIG. 15**.

FIG. 59 shows an applet version of the most active stocks display shown in FIG. 57A.

FIG. 60 shows an applet version of the most viewed stocks display shown in FIG. 57B.

FIG. 61 shows an applet version of the order book display shown in FIG. 6.

FIG. 62 shows an applet version of the news display shown in FIG. 10.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

As noted, the preferred embodiment supports both traditional on-line securities trading on national exchanges and on-line user-to-user trading outside the national exchanges. The preferred embodiment employs both a system specifically developed for such trading (sometimes simply referred to as the preferred system) and one or more broker/dealer computers of the type customarily employed for computerized on-line trading.

In the preferred embodiment, each of a multiplicity of users' workstations is simultaneously connected via the Internet to one of a plurality of broker/dealer computers and to a user-to-user trading system. Each broker's computer stores the account data and similar information customarily stored at a broker's server computer for the broker's clients. The preferred system communicates with each broker's server computer and in addition provides real-time updates for stock quotes both as a part of the service supporting day trading on national exchanges and as part of the service supporting user-to-user trading. For the user-to-user trading service the system maintains real-time data reflecting buy and sell orders for the supported securities, and is capable of displaying the same information for national exchanges if that data is provided by the exchange(s). This data reflecting users' orders to buy and sell for each security is referred to as the "order book" for a security. The users

interested in a given security receive at their workstations real-time displays of the order book for that security. In one embodiment of the invention, such order book information is selectively provided to users on a subscription basis. It is also capable of being displayed (free, or for a fee) by Internet portals such as Yahoo!, Altavista, etc.

Users' workstations, which are typically ordinary personal computers or other computer devices with sufficient processing and storage capabilities, store application software (also referred to hereinafter simply as "application") that supports a connection both to the user-to-user trading system and to the broker/dealer computer so as to display to the user the information available from both sources. As noted, the user's account and similar data is provided by the broker/dealer's server and the user-to-user trading data as well as real-time quotes are provided by the trading system. The application on the user's workstation preferably employs a user interface combining data provided from both sources.

FIG. 1 illustrates a communications system of the preferred embodiment. The system comprises a plurality of work-stations **10**, each of which is connected via a communications network **12** to one of a plurality of broker/dealer servers and databases **42** and each of which is connected via a communications network **15** to a hierarchical server and database structure **55**. The hierarchical structure comprises a root server and master database **50**, intermediate servers and databases **40**, replica servers and databases **30**, and a load balancer **20** interconnected by communications networks **34, 36** and **46**. In addition, the broker/dealer servers and databases **42** are connected to the root server and master database **50** via communication networks **41, 44**. The intermediate servers and databases **40** may not be used in some embodiments. In general, the number of levels of servers in the hierarchy of servers is based on the system load and specific capabilities of computers selected as servers, as understood by a person skilled in the art.

The computers employed as servers can range from personal computers to larger computers, e.g., workstations and multiprocessors, selected as understood by persons skilled in the art. Illustrative such computers are Pentium™-based computers and computers manufactured by Sun Microsystems™. The computers employed by the users are referred to as user's workstations and can be personal computers or other devices (e.g., Internet appliances) with sufficient processing capabilities as understood by a person skilled in the art. Illustrative such user workstations are personal computers using Pentium™ microprocessors and operating under a Windows 95™ or 'Windows 98™ operating system. One skilled in the art of computer systems will understand that the present invention is not limited to a particular class or model of computer employed for both servers and users' workstations and will be able to select an appropriate system based on the specific requirements.

It should be noted that a typical computer system that may be employed here as a server or a workstation includes a central processing unit, a primary memory, e.g., RAM, one or more secondary memory storage devices, e.g., floppy or hard disk drives, CD-ROMs, DVDs, or tapes, and communication interfaces, e.g., a modem, a network interface, or other connection to external electronic devices, such as a serial or parallel port. It also includes (primarily for the workstations) input devices, e.g., a keyboard, mouse, microphone, or other similar device and output devices, e.g., a computer monitor or any other known computer output device. A system bus provides communications between these elements.

Program execution of such a typical computer is usually controlled by an operating system, such as WINDOWS, DOS, or UNIX. Programs executed by the servers are resident at the server computers and run under the control of the server operating system. In the preferred embodiment, the user workstations execute application programs (applications), resident at the workstations, under the control of the operating systems of the workstations.

In other embodiments and as understood by a person skilled in the art, the functions of the workstation applications may be performed by the server and workstations may only include a browser, as known in the art, that enables a user to exchange information with the server.

The root server and master database **50** contains real-time security information, including order book information for each security that can be traded on the system, and a list of subscribers for each order book (see **FIG. 3**). In other words, it holds offers to buy and sell for each such security that are provided by the users of the user-to-user trading system (or by the national exchanges, if they provide access to their order books). As noted, the "book" refers to such user-to-user trading orders entered for each security. To support day-time trading, the master database includes real-time securities quote data supplied from conventional sources of such data. Advantageously, at least the stocks that are traded on the national exchanges can be traded on the system of the preferred embodiment.

Intermediate servers and databases **40** and replica servers and databases **30** include copies of the master database. Updates to the master database **50** are sent on a real-time basis to the databases **30, 40** via communications networks **34, 36, 46**. In the preferred embodiment, servers and databases **30, 40** and **50** are all located at the same site and the networks **34, 36, 46** are the same network, which is a local area network (LAN); but in alternative embodiments the servers and databases **30, 40** and **50** may be dispersed and the networks could also be the Internet, public or private telephone networks, or other methods of linking computers as known in the art. Network **15** preferably is the Internet, but may be public or private telephone networks or other communication networks known in the art.

In the preferred embodiment, when a replica server **30** receives updated information from a user workstation **10**, the replica server **30** does not update its database, but transmits the updated information to the root server **50**, which then updates the master database.

Thereafter, the updated information is transmitted to the intermediate and replica servers **40**, **30** which then update their databases. In an alternative embodiment, the replica and intermediate servers **30**, **40** update their databases as they are transmitting the information up to the root server **50**. In another preferred embodiment, the intermediate servers **40** do not include databases which replicate the master database, and essentially transmit information between the replica servers **30** and the root server **50**. This system enables real-time responses on Internet architecture.

As indicated, each workstation **10** is also connected to a broker/dealer server and database **42** via a network **12**. The broker/dealer server and database **42** contains a workstation user's account information (e.g., number of shares of each stock held by the user, amount of money in user's account, and other data relating to user's securities' holdings). In the preferred embodiment, the network **12** likewise is preferably the Internet. Alternative embodiments of network **12** include LANs, telephone networks, and other known methods of linking computers. Each broker/dealer server **42** is also connected via a network **41**, **44** to the master server **50**. In the preferred embodiment, this network connection is a secure point-to-point communication link. In an alternative embodiment, the network can be the Internet, telephone network, or another method of linking computers.

FIG. 2 illustrates an alternative embodiment. In such an alternative embodiment, all of the user's account information is stored in the master database **50**. Thus, there is no need for a user to access a separate broker/dealer server and database to obtain approval for transactions conducted on the system. This embodiment can be supported by the computer architecture discussed in connection with **FIG. 1** except that the broker/dealer computer is not used. That is, as illustrated in **FIG. 2**, the root server **50** communicates with optional

intermediate servers **40** which in turn communicate with replica servers **30**. The replica servers interact with users' workstations **10**. In this embodiment the servers store information relating to users' accounts and portfolios as well as to the data discussed above. This information is dynamically updated as a result of user transactions.

FIG. 3 is a flow diagram illustrating the operation of the preferred system for the user-to-user trades. This flow diagram provides an example of the steps by which a user connects to the system of the preferred embodiment, requests and receives a displayed order book for a selected stock, and purchases shares of that stock. Based on these examples, a person skilled in the art will understand how other sequences of operations for user-to-user trading can be performed. Also, based on this example, a person skilled in the art will understand how traditional trading during the day on national exchanges is performed in the preferred system. Preferably, traditional trading is accomplished on the broker/dealer system, except that real-time quotes for selected securities are continuously provided by the system.

To connect to the trading system of the preferred embodiment, a user at step **310** first activates the application which generates on the display screen of the user's workstation a connection status display (see **FIG. 53**) that establishes a connection to the server/database of the user's broker/dealer. As noted, in the preferred embodiment, the application is a computer program resident and executable at a user's workstation. When the user's ID and password are verified by the broker/dealer's server, the application establishes at step **314** a second, contemporaneous connection to the load balancer **20** for the replica servers **30**. At any one time it is expected that a large number of individuals will be connected to the hierarchical server and database structure **55** as well as to a selected broker/dealer server and database **42** of their choice. The load balancer determines to which replica server **30** each user should be connected to so as to substantially evenly distribute the load among the replica

servers. This determination may be based on criteria such as which replica server has the least number of users connected, which replica server is next in order, or on other considerations known in the art. The load balancer then transfers, at step **318**, the user's connection to the selected replica server **30**. The selected replica server and the broker/dealer server then provide to the user's workstation the information needed by the application to generate various displays. To avoid undue repetition, the subsequent description often describes a user's application as connecting to a replica server, instead of describing the application as first connecting to a load balancer and then to a replica server. It will be readily apparent to those skilled in the art that in such cases a load balancer, although not mentioned, is understood to be the initial connection point.

At step **322** the user selects a stock of interest by typing the stock symbol into an appropriate display (see **FIG. 6**, slot **642**); and at step **326** the application at the user's workstation sends the identity of the selected stock to the replica server **30**. The replica server and database then adds this user to the subscriber list for the order book of the selected stock. See step **330**. That is, the user is listed as a user who is to receive order book information for the selected stock. Thereafter, at step **334**, the replica server sends order book information to the user's application and continues to send updated information to the user's application in real-time. As indicated at step **338**, the application uses the order book information to fill in the order book display (see **FIG. 6**) and related displays. The user then views the order book display and related displays. Assuming that the user decides to sell some of his/her holdings in the displayed securities, at step **342** he/she fills in a trade ticket (see **FIG. 11**) for a sell order and selects the "Verification" button on the trade ticket display. (Alternatively, at this point, the user may choose to purchase securities. The purchase

transaction is discussed below in connection with steps 374-398). As indicated, at step 346, the user then views the final verification screen (see **FIG. 56**) provided by the application and selects the "Send" button. In response, the order is transmitted to the server and database of the user's broker/dealer, which checks, at step 350, whether the user has sufficient shares in his account for the requested transaction. The preferred embodiment does not provide for a short-sell option in the user-to-user trading, although this capability may be provided in the alternative embodiment, as understood by a person skilled in the art. Short-selling is customarily provided for trading during the day on a broker/dealer system.

If the transaction is approved, at step 354, the server of the broker/dealer sends the user's approved sell order to the root server 50, which attaches a system ID to the order, identifying the user's account, his order (stock symbol, size, price, and whether buy or sell), and his broker/dealer. At step 358 the root server 50 updates the master database with user's order, and revises the order book for the selected stock. The new sell order information is transmitted, at step 362, to the replica servers 30 which update their respective replica databases to reflect this sell order. Each replica server, which is connected to users that are listed as subscribers to the order book of the selected stock, sends at step 366, the updated order book information to the subscribers' applications, including the user's offer. The applications receive this sell offer and, at step 370, display the offer in the order book displays of the subscribed users. Although the order book information is provided from the appropriate replica server, the account information is preferably provided from the broker/server system.

Subsequently, another user who is likewise connected to the hierarchical server and database structure 55 as well as to a broker/dealer server 42 of his choice sees the first user's sell offer and, at step 374, accepts the offer (executing a buy order). The buy order, along

with an ID assigned to the corresponding offer to sell, is transmitted at step **378**, to the server and database of the buyer's broker/dealer using another, preferably Internet, connection that the buyer has to his broker/dealer system. The buyer's server checks, at step **382**, whether the buyer has sufficient funds or credit in his account to purchase the stock offered by the seller. The buyer may purchase stock on margin if he has a margin account and sufficient credit with the broker/dealer. Also, a broker/dealer may not authorize a transaction if buyer's profile and preference do not correspond to the characteristics of the security that he wants to purchase.

If the transaction is approved, at step **386**, the buyer's broker/dealer sends the approval of the order along with sufficient information to identify the buyer and the order to the root server **50**. At step **390** the root server **50** notifies the broker/dealer systems of both parties of the details of the transaction so as to identify which funds and shares must be transferred to which accounts, updates the master database to reflect the completed transaction, and transmits the updated order book information to the replica servers. The replica servers then update their respective databases and, at step **394**, transmit the updated order book information to the subscribing users. In the updated order book, the accepted offer to sell has been removed. The broker/dealer servers of both parties to the transaction notify the applications of the parties that the transaction is confirmed (by updating the open positions and related displays, and preferably also by email), and at step **398**, the applications update the current positions and related displays of the parties to the completed transaction. The exchange of securities and money takes place subsequently in a conventional way between the broker/dealers of the buyer and the seller.

FIG. 4 illustrates how the alternative embodiment illustrated in **FIG. 2** enables the real-time updating and transmission of information. In general, when a user provides new data to the replica server that his work station is connected to, this data propagates to the root

server **50**. From the root server **50** it then propagates to all the other replica servers. For example, user (A) enters at **470** an order to buy or sell a security at a certain price level (e.g., buy 100 shares of IBM at $180.00). The system then passes the user's order via step **485** to the root server **50** through an intermediate server **40**. The root server **50** then records the order and re-transmits the information through all the intermediate servers **40** and to all of the replica servers **30**, so that all databases remain synchronized. The front-line replica servers then transmit the user's order to the other users **455, 460, 465, 475,** and **480** who are on the subscriber-list for the security on order. If any of those users accepts the order of user **470**, this information goes up and down the chain the same as the order from user **470**.

FIG. 5 illustrates a graphical user interface (GUI) of the preferred embodiment. The depicted screen, known as the master trade screen, comprises several parts. The upper left part is a visual quote and order book display **500** (see detailed view in **FIG. 6**). Below that is a trade ticket **510** (detailed view in **FIG. 11**). The upper-right part is a news and information display **540** (detailed view in **FIG. 10**). Just below that is an open orders display **545** (detailed view in **FIG. 7**). Immediately below that is a current positions display **550** (detailed view in **FIG. 8**). Just below that is a financial summary display **560** (detailed view in **FIG. 9**). Below that is a stock summary display **520** (detailed view in **FIG. 12**). At the bottom of the master trade screen are function buttons **530** (detailed view in **FIG. 15**).

The function buttons **530** are of sufficient size to allow for the display of full-length labels sufficient to ensure maximum comprehension by the user. They are also of sufficient size and height to allow for the insertion of descriptive labels in languages requiring long character strings (German, e.g.). This feature enables the easy customization of the GUI for global markets.

The order in which the screen components **540**, **545**, **550**, and **560** are displayed in the right-hand display area can be altered based on user selections provided by permutation of the order in which the function buttons in bar **530** are selected. The buttons **530** are also used to remove the screen components **540**, **545**, **550**, and **560** by a single click selection of the corresponding button on the function button bar **530**. When screen components **540**, **545**, **550**, or **560** are shown in the master trade screen, the corresponding function buttons are highlighted in reverse video.

A user can alter the vertical size of screen components **540**, **545**, **550**, and **560** by selecting and dragging the borders of the components. This feature allows a user to determine the amount of information displayed in each of the screen components **540**, **545**, **550**, and **560**. The user can also change the size of the entire master trade screen by dragging the screen borders.

The combination of elements of the master trade screen display enables a user to view critical information necessary to make an effective decision concerning the status of the market in a stock or stocks of interest: current account balances, open orders, positions, news and research, e-mail communication, overall portfolio status, and the condition of all major markets. This information is displayed without the user having to switch to alternate screen views and without using overlapping windows. The order book display **500** (and the related displays – most viewed stocks display, chart display, and most active stocks display – see **FIG. 57B**) and the stock summary display **520** are provided by the application software based on data received from the replica server **30**. The open order display **545**, current positions display **550**, and the financial summary display **560** are provided by the application software based on data received from the server of the user's broker/dealer. Each of the displays **500**,

510, 520, 540, 545, 550, and 560 has a "Help" button in the upper right hand corner that provides a multi-level help system as set forth in greater detail in conjunction with **FIG. 26**.

FIG. 6 depicts a visual quote and order book display **510** for use in user-to-user after hours trading, and to display national market information. The status of the market (open or closed) is shown at **610**. The three columns **614** at the right comprise a compressed view pricing map, which shows a simplified view of the bid, ask, and spread for the stock in active trading and also shows the last trade of the day on the national exchange. The user's position is also displayed and is based on the average price of the shares held in the user's account. It is shown by the graphic indication **640** on the vertical price scale section. This graphic indication is an analog representation of the user's average price for the shares held in the stock shown in the price map display **614**. If the user's position is off the scale, an indicator is used to show the direction of the user's position. For illustration, such an indicator is shown in **FIG. 6** at the bottom of the column containing the user's position indicator **640**. The information displayed at **648** immediately below the price map display **614** is an alphanumeric summary of the user's average price of the stock, current profit or loss based on the current price of the stock, and the user's overall P&L percent gain or loss. This display is designed to provide a high-level view of the stock and its relative movement compared to the previous market and the user's position. If the user clicks on "More info" **616**, he is linked to an after-hours information site. The column **620** under "Day" is the national market indications column. The column **624** under "Nite" is the after-hours market indications column. The horizontal stripe **628** displays the amount of the last trade/ask, and is green. The horizontal stripe **632** immediately below that is a "zoom" view of the detailed spread, and is black. The horizontal stripe **636** just below that is the bid. The horizontal stripe **644** is

the last sale price in the national market, for the stock shown. The three displays **648** ("Your pos.," "P&L," and "Overall P&L") display the user's position data on the selected stock, calculated in real-time based on the real-time quote.

The seven columns to the left of the pricing map are the order book display. The order book display enables the user to see at a glance how a particular stock is trading on the user-to-user system. The order book is designed to give a lay user the same type of information that is available to brokers at the national exchanges.

The center column under "Decimals" is the price column, and lists stock prices in 1/16 increments. The three columns to the left of the price column set forth buy side orders and the three columns to the right set forth sell side orders. The "Limit Qty." and "AON Qty." columns list the size of orders at each price level posted into the system by other users. The Your orders show columns the user's order in the stock. The area **668** (in this example, containing the number 6000) contains the amount of the current ask size. The area **672** (in this example, containing the number 52.1875) contains the amount of the current ask price, and is highlighted in yellow.

The area **676** contains the price spread, and has a black background. The area **680** contains the current bid size (here, 200), and the current bid price (here, 52). It is highlighted in yellow. The "Order Bk." button **681** is selected to call into view the order book display as shown. The button **656**, "Compress spread," compresses the spread and orders included in the spread down to one line. The compressed view shows the last bid, best offer, and a single line spread shown on a red background with white characters (see **FIG. 54**). The quantity shown in the red bar is the total price of the spread in one line. If there are "all or none" (AON) orders contained within the spread they are shown as total amounts. When the display shows the compressed spread, the button **656** shows the label "Expand spread." Clicking the

button **656** then returns the display showing the full, evenly incremented spread. The button **664** ("Symbol") is selected when the user wants to display a different stock. When the button **664** is clicked, a data field is displayed wherein the user may enter the symbol of the new stock to be displayed.

When the "Chart" button **682** is selected, the order book display is replaced with the chart of stock activity displayed as in **FIG. 14**. When the "Most active" button **683** is selected, the stock summary display shown in **FIG. 57A** is displayed, with the most active stocks shown in real-time and updated in real-time. The "News out" button **660** flashes or is highlighted when news is out on the stock in view. The "Show news" button **688** causes screen component **540** to show the current news summary and details for the selected stock. An alternative means of displaying the stock order book, chart, and news is by double-clicking the desired stock shown in the stock summary display. The "Vol." number **677** indicates the volume of shares traded in the currently active market (national market or after-hours market). The "Hi" price **678** is the high sale price for the selected stock during the current trading session. The "Low" price **679** is the low sale price for the selected stock during the current trading session. The "Last Nite" number **689** shows the last sale price in the after-hours market. The "Chng. Nite" number **690** shows the percent change in the after-hours market. The "Last Day" number **691** shows the last call in the national market. The "Chng. Day" number **692** shows the percent change in the national market. The "Day Mkt" and "Nite Mkt" buttons **669** toggle the displayed "Vol.," "Hi," and "Low" numbers **677, 678,** and **679** between the after-hours market and the national market.

FIG. 7 depicts an open orders display **545**. This display shows the user's orders that have not yet been completed. A "Change" button **710** at the lower right is used to change an

order that is still open (see **FIG. 23** for a description of how an open order is changed). A "Cancel" button **730** at the lower left is used to cancel an order that is still open (see **FIG. 24** for a description of how an open order is canceled). A "Sort" button **720** is used to display the open orders according to different parameters.

FIG. 8 depicts a current positions display **550**. For each security in the user's account as identified by a standard symbol, the display indicates the number of units held, the cost per unit, the current price, the change in value and the dollar amount of the profit or loss. The "Sell" button **810** is used to pre-populate a trade ticket with a selected stock's information as listed in the user's current positions display. A conventional Windows-type scroll bar and up and down keys on the right hand side of the display are used to move a selection bar through the display of stocks. The "Sort" button **820** is used to sort the displayed positions by different parameters (price, quantity, etc.). The "Reports" button **830** is used to request news on the selected stock.

FIG. 9 depicts a financial summary display **560**. The balance for each category is shown in the "Balance" column **910**. The profit or loss for each account category is shown in the "Profit/loss" column **920**. The change in each account category for the day is shown in the "Change/Day" column **930**. The change in each account category for the year-to-date is shown in the "Change/YTD" column **940**. The "Equities" row **945** lists the user's equities account information. The "Mutual Funds" row **950** lists the user's mutual funds account information. The "Grand sum" row **955** lists the user's summarized account information. The "Cash acct." row **960** shows the funds in the user's cash account. The "Margin" row **965** shows the funds in the user's margin account. The "Open orders" row **970** shows the value of

the user's open orders. The "Negotiations" row **975** shows the value of the stocks the user has in negotiations. The "Buying Power" row **980** shows the user's buying power.

FIG. 10 is a news and information display. The news and information display is actually a customized Internet web browser, and its functionality is derived from that fact. For example, when the "Show Email" button **1010** is selected, a standard email server interface is displayed (see **FIG. 55**). The "Search" slot **1030** is used in the same manner as the "Address" slot in Internet Explorer and the "Location" slot in Netscape Navigator. The "Back," "Forward," "Home," and "Bookmarks" buttons, e.g., function the same way as their counterparts in other browsers. If the email display is being shown, the user clicks the "Show news" button **1020** to return to the news display.

FIG. 11 depicts a trade ticket display **510**. The "Action" slot **1125** is used to indicate whether the order is a buy order or a sell order. The "Quantity" slot **1130** is filled in with the number of shares in the user's order. The "Symbol" slot **1135** is filled in with the symbol of the stock the order is for. The "Limit" slot **1160** is used to indicate the nature (e.g., limit, stop) of the order. The "Limit Price" slot **1140** is filled in if the order is a limit order. The "Stop Price" slot **1145** is filled in if the order is a stop order. The "Duration" slot **1150** is used to indicate the duration of the order (e.g., day, good till canceled). The "Condition" slot **1155** is used to indicate whether there is a condition on the order (e.g., all or none). The "Account" slot **1165** is used to indicate the type of account used. The "Route to" slot **1170** is used to indicate special routing instructions (route order to a specific market). The user's buying power is displayed in the line **1112**. The user's balance if the proposed trade is executed is displayed in line **1114**. The total cost of the proposed trade is displayed in line **1116**. The "Clear" button **1115** clears the trade ticket entries. The "Negotiations allowed"

box **1175** is checked if the user is willing to negotiate on the order, and the "Anonymous" box **1180** is checked if the user wishes to remain anonymous. The "Verification" button **1110** is clicked to display the "Final Verification" screen.

FIG. 12 depicts a stock summary display. The button "WIT" **1210** at the left of the summary screen display is clicked to display the most active stocks in the trading system. When the button **1210** is clicked by the user, the application notifies the replica server, which then sends the required information back to the user's computer, where the application displays the most active stocks on the system. The button "Watch stks." **1220** is clicked to display stocks the user has added to his "watch list" (same as "wish list"; see **FIG. 51**). The button **1230** is used to display stocks the user holds in the system.

FIG. 13 depicts a multiple pricing maps display. Illustratively, **FIG. 13** shows pricing maps for six different stocks in the after-hours market. Each pricing map provides the same information in the same format as that in the pricing map depicted in columns **614** of **FIG. 6**. The identity of each stock is shown at the top of the pricing map **1335**. If the user double-clicks on the closing price of the stock **1310** in the national market (NM), a chart view of the stock is displayed (see **FIG. 14**). If the user double-clicks on the spread **1330**, an order book display (see **FIGS. 5 & 6**) for the selected stock is provided. The "News out" status indicator **1420** flashes when news is out on the stock that may have an effect on the stock's movement. To pull up news in a display on the right hand panel of the interface, the user double-clicks on the "News out" indicator. If the user double-clicks on a Buy button **1325** (or a Sell button), the application automatically pulls up a trade ticket (see **FIGS. 5 & 11**) that is filled with data from the user's positions file. The selection of "Sell" populates the trade ticket with the user's entire position in the selected stock. The selection of "Buy" populates the trade ticket

with information including a default quantity value set in the preferences menu by the user. The user can double-click on the best bid or offer and hit or take the quantity at that price level. This action automatically populates the trade ticket with the selected price. The user can adjust any values in any pre-filled fields. The red box **1315** in the center section of each pricing map shows the average price of the user's shares in the stock. This is a graphic analogue of the user's average price in the selected stock as shown in the user's positions file. A double-click of the red box **1315** brings the selected stock to the top of the user's positions file. If the user has multiple purchases in his file, the largest quantity is shown first. The values **1340** are updated in real-time as the market moves.

FIG. 14 depicts a real-time chart of stock activity. The thick black vertical line **1410** shows the close of the national market and the opening of the after-hours market. Line **1410** is blue. A similar line, not shown in **FIG. 14**, shows the closing of the after-hours market and the opening of the national market. The vertical lines **1430** show hour-long increments. A pricing map is shown on the right hand side of **FIG. 14** and displays essentially the same information in the same format as that depicted in columns **614** of **FIG. 6**. The horizontal bar **1415** shows the last trade/ask price in the after-hours market (in **FIG. 14**, the after-hours market is the market that is open). The bar **1415** is green. The horizontal bar **1425** is yellow, and shows the current bid price. The area **1420** between the bid and ask is the spread, and is in black. Since the national market is closed, the last price on the national market is indicated by the horizontal bar **1435**, and that bar is green. The vertical bar **1434** has an indicator **1432** (preferably red) showing the user's average share price in the stock shown. If a user's position in the stock shown is not viewable within the scale of the price chart a visual indication is shown at the top or bottom of the user's position column **1434** indicating the

direction in which the user's position sits with respect to the current market. The horizontal bar **1450** optionally contains a scroll bar (not shown) which permits the user to scroll horizontally over the past 24-hour period. The horizontal lines **1455** are price level lines which permit the user to quickly visualize pricing trends; the dollar values are provided in column **1470**. The price increments can be changed by clicking on the "Price map scale" button **1422**, and then choosing $1, $5, or $10 from the pop-up menu (not shown here, but see, e.g., **FIG. 60**, which has the same menu displayed under the "Price map scale" button). There are stocks whose daily fluctuations vary widely. The price map scale permits the user to visualize wider price ranges by selecting price scale increments of $1, $5, and $10. Such a selection re-scales the vertical axis of the price map to allow visualization of the entire day's trade range. As the price map's vertical scale changes, the dollar increments change but the vertical scale divisions do not change. The chart view of the stock will either expand or contract based on the scale values selected. The short vertical bars **1460** show the market spread at the time indicated. In the national market, these bars are black; in the after-hours market, they are blue. The short marks **1465** on the bars **1460** indicate the last trade price for the stock. In both the national market and the after-hours market, the marks **1465** are green. The "Order Bk." button **1412** allows the user to change the display from the chart display to the order book display (see **FIG. 6**). The "Most active" button **1416** allows the user to change the display from the chart display to the most active display (see **FIG. 57A**).

FIG. 15 depicts a function button display **530**. The Shrink button **1520** is used to shrink the display.

FIG. 16 illustrates four different views available through expanding and shrinking the master trade screen. If the initial view is the full master trade screen **1610**, the user clicks the

"Shrink" button **1520** to change the view to just the summary stock display and the function buttons shown in **1620**. If the "Shrink" button **1520** is clicked again, the view shrinks to just the function buttons **1630**. If "Shrink" is clicked again, the view is changed to the fully compressed view **1640**. Finally, if "Shrink" is clicked one last time, the application displays the message box: "Do you want to close your connection to [the system of the preferred embodiment]?" If the user selects "Yes," the application closes the display and only the icon of the subject system is displayed. **FIG. 28** provides a flow diagram depicting the operation of the Shrink button **1520**.

Returning to **FIG. 15**, the "Expand" button **1510** is used to expand the display. See **FIG. 29** for a detailed description of how the expand button operates. The "Peel off display" function button **1515** is used for displaying several order books at once (see **FIG. 27**). The "Alerts" function button **1525** is used to set alerts on stocks of interest (see **FIGS. 30 & 52**). The "Open orders" function button **1535** is used to display the user's list of open orders (see **FIG. 34**). The Positions and P&L ("Pos./P&L") function button **1540** is used to display the user's positions and profit and loss information (see **FIG. 35**). The "Account history" function button **1545** is used to call up a display of the user's account history (see **FIG. 36**).

The application software used in the practice of the invention is described in greater detail in conjunction with **FIGS. 17-40** below.

FIG. 17 is a flow diagram illustrating software which enables a user to obtain and install the graphical user interface (GUI) component of the preferred embodiment and open a new account. Initially, at step **1710**, a user desiring to use the system of the preferred embodiment accesses the Internet website of the system administrator. The user views and/or downloads, at step **1715**, the software and hardware requirement list from the administrator's

website. At step 1720 the user determines if he has the proper software and hardware are present on his computer. If not, at step 1725, the user obtains upgrade information and URLs (Internet addresses) where the proper software can be obtained. Alternatively, the user is provided with the necessary software by the system administrator, such software being obtained from an application server database maintained by the system administrator.

Once the proper software and hardware are present, at step 1730, the user downloads the full application software from the application server. The user then opens the application on his personal computer. See step 1735. Once the application is opened, the application establishes a connection over the Internet, and at step 1740. the user attempts to open an account. At step 1750 the user receives data from an account opening database and help database of the system, and enters the sequence required for opening an account on the system. If the account is successfully opened, the full application is active for trading based on the balances in the account and other limitations to be determined by the system administrator. See step 1755. If the account is not successfully opened, the user is connected to the system's account opening database and help database for assistance.

FIG. 18 is a flow diagram illustrating software for logging on to the system and visualizing the stock market in the alternate embodiment described in connection FIG. 3. Initially, at step 1805, the user opens the application (Java application, in the preferred embodiment). The Java application then, at step 1810, attempts to initiate a connection to a replica server. At step 1815, if the connection to the replica server is confirmed , the user inputs, at step 1820, the user's name and password at the log-on screen (see FIG. 53) of the application. If the connection to the replica server is not confirmed, at step 1825, a dialog

box is displayed by the application to the user describing a possible cause of the problem and a possible way to resolve it.

At step **1820** after the connection has been successfully established and the user's name and password have been entered, the application transmits, at step **1830**, the user's name and password to the replica database. The database on the replica server then checks, at step **1835**, the accuracy of the name and password. If there is no match, the user, at step **1850**, again receives a dialog box with an indication of the problem and a possible solution. If there is a match, the replica server notifies the root server that the user has successfully logged on. At step **1840** the changes to the replica database are provided to the master database.

Once the user's logon is complete, the application receives, at step **1860**, the user's filtered information based on user's preferences saved on the replica server. In an alternate embodiment, the application receives unfiltered or partially filtered information from the replica database, and the application does further filtering once the information has been received. The application then, at step **1865**, displays (depending on the user's display preferences) a master trade screen showing all critical trade data, based on the user's preferences. As the user's position in his stocks changes, the replica database and server, at step **1870**, automatically updates the user's display in real-time. Each time a change occurs in the information held on the replica server, the master database is updated accordingly at step **1840**.

FIG. 19 is a flow diagram illustrating software of the preferred embodiment which enables a user to view critical trading and account information on one screen so as to facilitates fast and accurate trading of stocks. Initially, at step **1910**, the user opens a master trade screen. Preferably, the master trade screen is that shown in **FIG. 5**. The master trade

screen, at step **1915**, displays all information necessary for the user to make a decision about the status of his account, the status of the stocks of interest, and the status of the markets in general. Illustratively, data displayed on the master trade screen includes a trade ticket, real-time quotes, the user's positions, open orders, an order book display, financial summary, account balances, news and information related to stocks of interest, and other items illustrated in connection with **FIG. 5** and discussed herein. After viewing the master trade screen, the user selects at step **1920** a trend chart view to review the trend of the stock of interest in either the national market or the after-hours market.

At step **1925**, the user may decide to look at another stock and, at step **1930**, he selects the stock of interest from the stock summary display. The application transmits the user's request to the replica server and database, which transmits information on the selected stock back to the application executing on the user's workstation. The application, at step **1935**, displays the new stock in the order book view and, at step **1940**, populates the trade ticket (see **FIGS. 5 & 11**) with information regarding the selected stock. At step **1945**, the application displays news for the selected stock in the news display (see **FIGS. 5 & 10**). In addition, the application highlights, at step **1950**, the user's position in the selected stock in the positions display. At step **1955**, the application indicates the alert status for the selected stock, and, at step **1960**, it shows selected help functions in the background. At step **1965**, the application shows profit or loss if the user sells his position in the selected stock at the current level shown in the order book display (see **FIGS. 5 & 6**).

FIG. 20 is a flow diagram illustrating software of the preferred embodiment which enables a user to visualize the detailed market in stocks. For the purposes of illustration, we assume that, at step **2010**, the user desires to see the status of stock not shown in the current

master default view. The user then, at step **2015**, views basic information on stocks by selecting alternate summary screen views using the stock summary display of **FIG. 12**. The alternate views are (1) in the stocks the user holds in the system ("Your stks."); (2) stocks that are among the most active in the current market ("WIT"); and (3) stocks that the user wishes to monitor ("Watch stks."). The user switches from one view to another by clicking the appropriate button (**1210, 1220**, or **1230**) at the left of the summary screen display (see **FIG. 12**). At step **2020**, if the stock in which the user is interested is displayed in the summary display, the user selects, at step **2030**, the stock from the summary display (by clicking on its symbol) to obtain more detailed information regarding the stock. If the stock is not shown in the summary display, the user selects, at step **2025**, the "Quick quote" function to select the stock of interest (see **FIG. 51**). The user can also enter stock into the stock summary display by typing into or over stock in the wish list. Once the stock has been selected, the application transmits to the replica server the fact that the user is requesting information on a different stock. In response, the replica server provides data on the new stock to the user's application and keeps this information updated in real-time. Next, at step **2035**, the application populates the master trade screen with detailed data on the selected stock. At step **2040**, the user reviews the status and price of the stock on the master trade screen and, at step **2045**, determines the best available price based on the data provided on the master trade screen.

FIG. 21 is a flow diagram illustrating software of the preferred embodiment which enables a user to execute a buy order for a stock. We assume that the user makes a decision to purchase shares of stock, and at step **2115**, the application retrieves and displays summary information including (1) the stocks held by the user; (2) stocks that are among the most active in the current market; and (3) stocks that the user wishes to monitor. If the stock in

which the user is interested is displayed as part of this summary (see **2120**). at step **2130**, the user indicates to the application that he/she desires to view further details regarding the stock listed on the summary display. If the stock is not listed in the summary, at step **2125**, the user may select the "Quick quote" function to display data regarding the stock of interest, or by typing into or over stock in the wish list. The user can change the order in which stocks are listed in the stock summary display by using the preference screen to position the stocks by industry, position, size, or P&L.

After the user has selected the stock, the application transmits this data to the replica server. In response, the replica server sends data on the new stock back to the application running on the user's workstation and then updates this data in real-time. At step **2135**, the application populates the master trade screen with the relevant information on the selected stock. At step **2140**, the user inputs additional information into the trade ticket (see **FIGS. 5 & 11**). Then, if the user is still satisfied with the transaction, at step **2145**, he/she selects the "Order Verification" function, and in response, at step **2150**, the application checks for errors in the data entered into the trade ticket. If there are errors (step **2155**), then at step **2160**, the application retrieves and displays appropriate error messages and, in some instances, suggestions on how to correct the error. Once the application determines that the ticket is error-free, at step **2165**, the application displays the "Final Verification" screen (see **FIG. 56**). At this point, the display flashes, to emphasize the significance of this operation. Thereafter, the user makes the final decision whether to send the buy order, and at step **2170**, selects the "Send order" option to facilitate the purchase. The request is then transmitted to the broker/dealer system used by the user.

At step **2180**, the application displays the order transmission status in the message line display. The application, at step **2185**, illustrates the buy order highlighted in yellow in the

open positions display on the master trade screen. If the order has been filled on a national market, the broker/dealer's computer communicates this to the user's workstation. If the order is accepted in the user-to-user market, the buyer's acceptance is transmitted to the root server via replica servers. The root server updates the root database and transmits that information back to the replica servers and databases. Thus the order is always visible as it moves through the execution process; the status of the order is always known. The application moves, at step **2190**, the buy order into the user's "Positions and Balances" display. At step **2195**, the application displays the account information reflecting this transaction in the master trade screen.

FIG. 22 is a flow diagram illustrating software which enables a user to execute a sell order of a stock using the preferred embodiment. We assume that, initially, the user makes the decision to sell shares of a stock that he owns (see **2210**). Next, at step **2215**, the user selects the stock from the positions display **550** and selects the "Sell" button **810**. Once the stock has been selected, the application transmits to the broker/dealer's computer the fact that the user is requesting information on that stock and, in response, receives data on the stock. The application then, at step **2220**, populates the master trade screen and the trade ticket (see **FIGS. 5 & 11**) with available information on the stock. At step **2225**, the user fills in additional information into the trade ticket and checks the final total cost of the trade.

At step **2230**, the user selects "Order Verification" function and in response, the application checks, at step **2235**, for errors in the data that have been entered into the trade ticket. If at step **2240**, an error has been found, the application displays at step **3250**, an error message along with possible ways for correcting an error. Once the ticket is error-free, the application displays at step **2255**, a flashing final verification screen. The user then makes the final decision whether to send the sell order, and at step **2260**, selects the Send order

function. The application then transmits the user's order to the broker/dealer system used by the user. At step 2265, the application assigns a reference number to the order and displays the order transmission status in three steps in the message line display. Then, at step 2270, the application shows the order highlighted in yellow in the Open orders display of the master trade screen. After the order has been filled and confirmed, the application moves, at step 3275, the sell order into the user's Positions and Balances display and displays updates to the user's account files and new balances in the master trade screen (see step 2280).

FIG. 23 is a flow diagram illustrating software which enables a user to execute a change order in a stock purchase order already entered into the system. We assume that, initially, at step 2310, the user makes a decision to change one or more variables of an open stock order (list 545). At step 2315, the user selects the stocks from the open orders display (see FIGS. 5 & 7) and selects the Change button 710. In response, the application, at step 2320, populates the master trade screen and trade ticket (see FIGS. 5 & 11) with information from the "Open Order" screen selection. The user, at step 2325, changes information in the trade ticket, checks the final total cost of the trade, and 2330 selects "Order Verification."

In response, at step 2335, the application checks for errors in the data that has been entered into the trade ticket, and displays the effect the changed order will have on the user's account. If an error has been found, the application, at step 2340, displays an error message, and possibly options for correcting the error. If the ticket is error-free, the application displays, at step 2345, a flashing final Verification screen, and in response the user may make the change order, via the "Send order" command. The application then transmits the change order to the broker/dealer's computer.

If the original order has already been executed, the user is alerted to that fact by a message indicated that the change order has been rejected. At step **2350**, the application displays the order transmission status in the message line display. At step **2355**, the application shows the changes in the open orders display (see **FIGS. 5 & 7**) of the master trade screen highlighted in yellow. When the changes are confirmed, at step **2360**, the application removes the yellow highlight in the open positions display. The system then, at step **2365**, updates the display of the account data and balances accordingly on the master trade screen.

FIG. 24 is a flow diagram illustrating software which enables a user to execute a cancel order for a stock purchase that has already been entered. First, the user makes the decision, at step **2410**, to cancel an order in the open orders file. The user then, at step **2415**, selects the stock from the open orders display (see **FIGS. 5 & 7**) and selects the "Cancel" button **730**. The application, at step **2420**, populates the master trade scree and trade ticket (see **FIGS. 5 & 11**) with information from the open order screen. At step **2425**, the user changes information in the trade ticket, checks the final total cost of the trade, and, at step **2430**, selects "Order Verification."

After the "Order Verification" function has been selected by the user, the application checks, at step **2435**, for errors in the data that has been entered into the trade ticket. If an error has been found, the application displays an errors message, at step **2440**, and possibly a suggestion how to correct it. Once the ticket is error-free, the application displays, at step **2445**, a flashing final Verification screen. The user then makes the final decision to send the Cancel order, and selects the "Send order" function. The application transmits the user's cancel order information to the computer of the broker/dealer.

If the original order has already been executed, the user is alerted to the fact that the cancel order is rejected. At step **2450**, the application displays the order transmission status in the message line display. At step **2455**, the application then shows Cancel, highlighted in yellow, in the open orders list (see **FIGS. 5 & 7**) of the master trade screen. When the cancellation is confirmed, at step **2460**, the application removes the yellow highlight in the open positions display. At step **2465**, the system displays updates to the user's account files balances on the master trade screen.

FIG. 25 is a flow diagram illustrating software which enables a user to negotiate for a better price in a stock during the user-to-user trading of the preferred embodiment. At step **2510**, the user makes the decision to negotiate for a better price than the best bid and offer shown in the order book (see **FIGS. 5 & 6**). At step **2515**, the user double clicks on the quantity column in the order book at a price different from the best bid and offer. The application requests the appropriate information from the replica server, and, at step **2520**, displays in the negotiations screen (see **FIG. 42**) a list of traders who have orders in the market at the selected price. Then, at step **2525**, the user selects the name of a trader to negotiate with directly. The application, at step **2530**, shows the negotiation ticket populated with the selected trader's data. At step **2535**, the user then inputs an offer to the selected trader and, at step **2540**, selects the "Order Verification" screen and related costs summary. The user then, at step **2545**, reviews the verification screen and selects Send Order. At step **2550**, the application displays the order transmission status in the message line display and, at step **2555**, shows "Negotiation", highlighted in yellow, in the open negotiations display on the master trade screen.

At step **2560**, the user's offer to the selected trader is transmitted by the application to the replica server, which transmits the offer to the root server. The offer is then transmitted through the appropriate chain of replica servers until it is received by the other party's workstation where it is displayed on the negotiation screen in highlight. The other party, at step **2565**, reviews the offer. The other party is provided with an option to accept, reject, or make a counteroffer. At step **2570**, the response of the other party is transmitted to the user who made the offer. This process repeats until negotiations are completed or canceled (see step **2575**). When the order execution is confirmed, the application, at step **2580**, removes the yellow highlight in the open positions display and moves the order to the account history file. The application then, at step **2585**, displays the update to the user's account and balances in the user's master trade screen.

FIG. 26 is a flow diagram illustrating software and the computer operation of the context-sensitive "Help" function of the preferred embodiment. If, the user encounters a situation that requires additional information (see **2610**), at step **2615**, the user selects the "Help" button from the upper-right-hand corner of the display for which help is needed. The application, at step **2620**, populates the "help" display with a three-level help for the area selected by the user. The user, at step **3625**, views an index of headings relating to the problem and selects the desired topic. If necessary, the application, at step **2630**, shows the next level of detail in the "Help" display. The user then, at step **2635**, views detailed problem resolution text and diagrams, and requests additional detail if necessary. If more details are needed, at step **2640**, the application displays the third level of detail, along with an Internet link to a help system. The user, at step **2645**, selects the link to the server help functions and the system connects to the on-line help server and displays more data relating to the problem.

Then, at step **2650**, the user selects whether to use a link regarding the help topic or telephone support. If telephone support is selected, the system, at step **2655**, connects the user to the help desk by Internet telephone or other voice connection and the user interacts with the help desk to resolve the problem (step **2660**). If necessary, the system help desk, at step **2665**, fills out a job order and files it with the on-line help administrator for review. At step **2670**, the on-line administrator determines the priority of the reported problem and then, at step **2675**, generates an addendum to the on-line help function and posts it in the "Help" system files. If the problem is critical, at step **2680**, the on-line help administrator posts an e-mail message to users on the system. In any case, the on-line help administrator posts, at step **2685**, an e-mail message to the user group forum.

FIG. 27 is a flow diagram illustrating software which enables a user to view several instances of order books on one screen. Initially, at step **2710**, the user decides to view several stock order books on the display at once. The user, at step **2715**, views basic information on the stocks by selecting alternate summary screen views. The views include: (1) the stocks held by the user; (2) stocks that are among the most active in the current market; and (3) stocks that the user would like to monitor. If a security of interest is shown in the summary display (see step **2720**), the user selects, at step **2740**, the security from the stock summary display (see **FIGS. 5 & 13**) to view the stock information in detail. If the security is not shown in the summary display, the user selects, at step **2725**, the "Quick quote" function and related options. The user's request is transmitted by the application to the replica server, which transmits the relevant stock information back to the user's application. This new information is kept updated in real-time by the replica server. The application then, at step **2730**, shows the quote on the selected stock, and the user, at step **2735**, selects desired display

options. When the stock has been selected, the application populates 2745 the master trade screen with detailed data on the stock. If desired, the user, at step 2750, selects the stock symbol in the stock summary display, and, at step 3755, selects the Peel off display function from the function button display (see FIG. 15).

At step 2760, the application generates a new order book view for the selected stock. That view is shown outside the master trade screen. The user, at step 2765, repeats the operations 2720 through 2760 for stocks the user wishes to see at one time. The user then, at step 2770, drags order book views into the desired organization on the screen (see FIG. 57C). In response, the application, at step 2775, displays the status of stock in the order book configuration in real-time. To trade from any order book view, the user, at step 2780, selects the "trade" function. In response, the application, at step 2785, pulls up the master trade screen and populates the trade ticket with selected stock data (see FIGS. 5 & 11).

FIG. 28 is a flow diagram illustrating software for compressing the view of the master trade screen of the GUI of the preferred embodiment. FIG. 15 illustrates the effect of these steps on the master trade screen. Initially, the application shows the master trade screen at full size, see 2810. At step 2815, the user selects the "Shrink" function from the master trade screen and in response, at step 2820, the application shrinks the display to show only the stock summary display and function buttons. If the user selects the Shrink function again (step 2825), the application, at step 2830, shrinks the display to show only function buttons. If, at step 2835, the user selects the Shrink function again, the application, at step 2840, shrinks the display to show the fully compressed view. If the user selects Shrink from the most compressed view (see 2845), the application, at step 3850, displays the message box: "Do you want to close your connection [to the system of the preferred embodiment]?" If the

user, at step **2855**, selects "Yes", the application closes the display and only the icon of the preferred system is displayed.

FIG. 29 is a flow diagram illustrating software for expanding the display of the GUI of the preferred embodiment to obtain the full view of the master trade screen. Illustratively, the application initially shows the most compressed view of the GUI of the preferred embodiment (see **2910**). The user, at step **2915**, selects the "Expand" function **1650** and the application, at step **2920**, expands the display to show only the function buttons and then at step **2925**, the user selects the "Expand" function again and the application, at step **2930**, expands the display to show the stock summary display and function buttons **1620**. If the user, at step **2935**, selects the "Expand" function once again, the application, at step **2940**, expands the display to show the full master trade screen **1610**.

FIG. 30 is a flow diagram illustrating software of the preferred embodiment for alerting a user to movements in stock price according to user-defined preferences. Initially, the user makes a decision, at step **3010**, to have the system monitor stock movements and alert him/her accordingly. At step **3015**, the user views basic information for different stocks by selecting alternate summary screen views, which include: (1) the stocks held in the system by the user; (2) the stocks that are among the most active in the current market; and (3) stocks that the user would like to monitor.

If the stock of interest is shown in the summary display (see **3020**), the user selects, at step **3030**, the stock from the stock summary display (see **FIGS. 5 & 12**). If the stock of interest is not shown in the summary display, the user selects, at step **3025**, the "Quick quote" function and related options. The user's request is transmitted by the application to the replica server and it is kept updated in real-time by the replica server. Once data about the

stock has been displayed, the user selects, at step 3035, the "Alerts function," and the application, at step 3040, displays the "Alerts set-up function" (see FIG. 52).

At step 3045, the user chooses the criteria for the alert function and display options, and the application transmits 3050 the user's alert preferences to the replica server, which updates the user's profile on the replica database. The replica server then 3055 checks for movement in stock price, based on the user's selected criteria, in the stock of interest. The replica server automatically monitors price data and if an alert condition occurs, sends an alert (along with relevant stock information) to the user's application when appropriate (see 3060). In response, the application, at step 3065, displays the alerts in the stock summary display and may provide an audible alert. At step 3070, the user receives the alert(s) and selects the stock from the stock summary display for detailed view in the order book. The user may cancel the alerts or revise the alert criteria (see 3075) and the system continues to monitor the selected stocks based on the user's criteria (see 3080).

FIG. 31 is a flow diagram illustrating software of the preferred embodiment that enables a user to visualize the general status of stocks and related positions via an analog graphic display. Initially, the user desires a quick overview of the status of several stocks (see step 3110) and, at step 3115, selects the Summary view function. In response, the application, at step 3120, populates the master trade screen with a summary view of the selected stocks. The user adds stocks to the view (step 3125) by clicking on the appropriate symbol in the stock summary display (see FIGS. 5 & 12) and the application (at step 3130) adds summary views to the master trade screen based on the user's selections.

If the user wants to trade one of these stocks, at step 3135, the user makes a selection from the summary display that directs the application to enter active trade mode. As a result,

the application, at step **3140**, automatically populates the trade ticket (see **FIGS. 5 & 11**) and prepares the master trade screen with data on the selected stock.

FIG. 32 is a flow diagram illustrating software of the preferred embodiment that enables a user to visualize the best price in a security from an analog graphic display. The user seeks (step **3210**) the best price for the same security that is selling on different markets (see **FIG. 39**) and, at step **3215**, selects the symbol for this security from the stock summary display (see **FIGS. 5 & 12**) and the Show price options function. The application transmits the user's request to the replica server which, in response, transmits information to the application concerning the price of the stock in different markets. The replica server continues to transmit that information in real-time until it receives notice from the application to terminate the transmission.

The application, at step **3220**, populates the master trade screen with a summary view showing the price in all available markets for the security. At step **3225**, the user views the display showing the prices for the security in the available markets, and selects the preferred market and, at step **3230**, the application displays details of the selected market and automatically populates the master trade screen with relevant data (after requesting and receiving that data from the replica server). If a trade is desired, the user, at step **3235**, makes a selection from the summary display that directs the application to enter the active trade mode and, at step **3240**, it automatically populates the trade ticket (see **FIGS. 5 & 11**) and prepares the master trade screen with data on the selected stock.

FIG. 33 is a flow diagram illustrating the operation of the news gathering and distribution system of the preferred embodiment. Initially, at step **3310**, the user defines his interest based on watch list stocks and portfolio holdings active in his account. The user then,

at step 3315, sets "News alerts" preferences for the watch list and active account stocks. At step 3325, the system stores the user's preferences on the replica server database for the watch list and the user's active positions. At step 3320, that stored information is also transmitted to the user account preferences database on the replica server. The same information is transmitted to the news server, at step 3375, which monitors stocks based on user preferences from the watch list and active account information. Alerts are sent from the news server, at step 3375, back to the replica database and server for distribution to the end user display at step 3320. The news server, at step 3375, also passes news and alerts, at step 3390 to outside services. Data out may include: news of the system's most active stocks; news of other stocks; news forecasts; real-time quotes; an order book applet; a chart applet; a most active applet; a news applet; or other specific news on the overall market on the system.

At step 3395, the news desk of the subject system performs three general functions. First, at step 3370, it receives highlighted news alerts based on filters from the news server and the system's most active updates, received from the trade match system via step 3385. These filters are applied to news feeds received via step 3380, from outside vendors. Second, the news desk prepares alerts messages, at step 3365, for posting in the "News out" button on the order book of the end user display. This information is transmitted, at step 3375, to the user via the news server and the replica database and server, at step 3320. Third, the news desk, at step 3360, prepares stories and highlights based on the sort functions in the news display. Again, this information is transmitted to the end user at step 3375 via the news server and the replica database and server at step 3320. The system then tracks, at step 3330, the user-defined list of stocks for news. The application displays, at step 3335, news alerts to the user according to a user-defined display configuration. The "News out" function is shown

in the stock summary display (see **FIGS. 5 & 12**) or in the order book. At step **3340**, the user then views a "News alert" and calls the stock to the order book display (see **FIGS. 5 & 6**). At step **3345**, the application populates the "News" display (see **FIGS. 5 & 10**) with relevant news on the selected stock. At step **3350**, the user chooses to see more detail or sorts the news by category. At step **3355**, the application then populates the "News" display with additional relevant data.

FIG. 34 is a flow diagram illustrating software which enables a user to view the status of his open orders in a stock. Initially, at step **3410**, the user seeks to review his open orders in all stocks active in his account. At step **3415**, the user selects the open orders function from the function buttons display (see **FIGS. 5 & 15**). At step **3420**, the application displays the entire list of open orders in the open orders (see display in **FIGS. 5 & 7**) display of the master trade screen. At step **3425**, the user views the display showing the open orders. The user selects a stock, at step **3430**, from the stock summary display (see **FIGS. 5 & 12**) and selects the "Open orders" function. The application then, at step **3435**, displays only open orders for the selected stock in the open orders display. The user selects, at step **3440**, the desired open order from the list. The application highlights the order for actions by the user, such actions including cancel, change, or replace. At step **3445**, the user selects an operation (e.g., cancel, change, or delete) from the open orders display. The application automatically populates the trade ticket, at step **3450** (see **FIGS. 5 & 11**), with information from the open orders display on the selected stock. At step **3455**, the user executes the desired function as requested in the trade ticket. To hide open orders, the user selects, at step **3460**, the Open orders function from the function button display (function bar). The application then removes

the open orders display and removes the indication from the open orders function, at step 3465.

FIG. 35 is a flow diagram illustrating software which enables a user to view the status of positions and profit and loss information (P&L). Initially, at step 3510, to review his positions and P&L in the stocks held in his account, the user selects the "Positions and P&L" button 1540 from the function bar, at step 3515. The application displays, at step 3520, the user's entire list of positions and P&L and related details in positions and P&L displays, 550, in the master trade screen. At step 3525, the user views the display showing the user's positions and P&L in the display, organized by the sort function. At step 3530, the user selects a stock from the stock summary display (see FIGS. 5 & 12) and selects the "Positions and P&L" function. The application then requests updated information from the broker/dealer server on the user's positions and P&L in the selected stock. In an alternate embodiment, the application calculates the user's P&L based on the updated stock price and user account information stored on the user's computer. The stock price information is kept updated in real-time by the replica server. At step 3535, the application displays only positions and P&L for the selected stock in the positions and P&L display. At step 3540, the user selects the desired stock position directly from the "Positions and P&L" display. The application highlights the stock for actions (e.g., buy, or sell) by the user. The user selects, at step 3545, an operation from the positions and P&L display (e.g., buy, or sell). The application automatically populates the trade ticket, at step 3550 (see FIGS. 5 & 11), with information from the positions and P&L display. The user executes the desired function, at step 3555, according to the trade ticket functions. To hide the positions and P&L display, the user selects, at step 3560, the "Positions and P&L" function from the function bar. At step

3565. the application removes the positions and P&L display and removes the indication from the positions and P&L button.

FIG. 36 is a flow diagram illustrating software which enables a user to view account history. Assuming that, initially, at step **3610**, the user seeks to review his account history, at step **3615**, the user then selects the "Account History" function **1545** from the function bar. The application displays, at step **3620**, the entire list of the user's account history and related details in a display in the master trade screen. The user views the display showing his account history at step **3625**, organized by the sort function. At step **3630**, the user selects a stock from the stock summary display (see **FIGS. 5 & 12**) and selects the "Account History" function. At step **3635**, the application displays only account history for the selected stock in the Account History display. The user selects the desired account activity item, at step **3640**, directly from the Account History display. The application highlights the item for actions (e.g., more details, print) by the user. To hide the account history display, the user selects the "Account History" button from the function bar. The application then, at step **3650**, removes the "Account History" display and removes the indication from the "Account History" button.

FIG. 37 is a flow diagram illustrating software which enables a user to view the status of his account balances. Initially, at step **3710**, the user seeks to review his account balances. The user then, at step **3715**, selects the "Accounts" account balances function **1550** from the function bar. The application displays, at step **3720**, the entire list of account balances and related details in the "Accounts" display of the master trade screen. The user views, at step **3725**, the display showing his account balances in the display, organized by the sort function. The user, at step **3730**, selects a stock from the stock summary display (see **FIGS. 5 & 12**) and selects the "Accounts" function **1550**. The application, at step **3735**, displays only

account balances for the selected stock in the Account Balances display. The user then selects, at step **3740**, the desired account activity from the Account Balances display. The application highlights the item for actions (e.g., more details, print) by the user. To hide the account balances, the user selects, at step **3745**, the "Accounts" function **1550** from the function bar. At step **3750**, the application removes the Account Balances display and removes the indication from the Account Balances function.

FIG. 38 is a flow diagram illustrating software which enables a user to receive and view e-mail messages for account activity functions. Initially, at step **3810**, the user undertakes an operation that results in activity in his account. The replica server, at step **3815**, detects said activity and generates a structured e-mail message. At step **3820**, the replica server sends the structured e-mail message to the user's application in two parts, a summary stream and a detailed stream. The application receives and displays at step **3825**, the summary e-mail message in the status display in the stock summary display (see **FIGS. 5 & 12**), in color-coded text. If the user does not have the full e-mail display open, the user selects the "E-mail" function, at step **3845**, from the function bar. At step **3850**, the application displays the full e-mail display in the master trade screen. To hide the e-mail display, the user selects the "E-mail" function, at step **3855**, from the function bar. The application removes the e-mail display, at step **3860**, and removes the indication from the "Email" function.

The preferred embodiment also enables the user to use the stock summary display fields to call only e-mail on desired stocks. Initially, at step **3875**, the user selects a stock from the stock summary display and then selects the "E-mail" function. The application transmits the user's preference to the replica server, which updates the user's preference file,

and transmits e-mail messages for the selected stock back to the user's application. The application, at step **3880**, displays e-mail for the selected stock in the "E-mail" display. At step **3885**, the user selects the desired e-mail item directly from the "E-mail" display. The application highlights the selected item for actions (e.g., more details, print) by the user.

FIG. 39 is a flow diagram illustrating software which enables a user to view and select the best price for the same stock sold in several markets. Initially, at step **3910**, the user makes the decision to seek the best price for the same stock that is trading in several different markets. At step **3915**, the user selects the "Best Price" function. The application shows the simplified trade screen at step **3920**. The user inputs the symbol for the stock, at step **3925**, the quantity, and whether he wants a buy price or a sell price. The application transmits the user's request to the replica server. The replica server searches its database which contains stock market information updated in real-time. The replica server then transmits information for that stock to the user's application, which, at step **3930**, displays information on alternate markets and displays quotes in analog price maps (see **FIG. 57**) or in alphanumeric format. At step **3935**, the user views alternate prices for the same stock and selects a market. At step **3940**, the application populates the trade ticket (see **FIGS. 5 & 11**) with selected market, symbol, price, and quantity information. The user reviews the verification screen, at step **3945**, and selects Send order. The application transmits the user's order to the broker/dealer server, which in turn transmits the order to the requested market. In the meantime, at step **3950**, the application displays the order transmission status in the message line display. When execution is confirmed, at step **3955**, the broker/dealer server notifies the user's application. The application removes the yellow highlight in the open positions display and moves the order to the account history file. The broker/dealer server

updates the user's account files, at step **3960**, and calculates new balances. The application updates new data in the master trade screen displays.

FIG. 40 is a flow diagram illustrating software which enables a user to view the market in a stock by accessing the visual quote (see **FIGS. 5 & 6**) and price map display. Initially, at step **4010**, the user selects a stock from the stock summary display (see **FIGS. 5 & 12**) or by entering the stock symbol in the order book display (see **FIGS. 5 & 6**). The application transmits the user's request to the replica server, which sends the requested information back to the user's application. This information is kept updated in real-time by the replica server. At step **4015**, the application displays the order book visual quote, which includes the following information: (1) prices in descending order; (2) quantities at a given price level; (3) the user's orders at a price level; (4) buy side best price; (5) sell side best price; (6) the bid-offer spread; (7) an alphanumeric quote for the stock; (8) all-or-none orders at price levels; (9) a chart function button; (10) a most active button; (11) the news out indicator; (12) the market open/closed indicator; (13) the symbol entry field; and (14) the compress spread function. If the price map display (see **FIG. 13**) is selected, the display includes: (1) a low-resolution price scale; (2) a closing price in the national market(s); (3) the current spread in the after-hours market; (4) the last sale in the after-hours market; (5) the user's average price on shares held; (6) the user's current P&L; (7) the user's current total position; (8) the user's numeric price average; and (9) the Buy and Sell buttons.

At step **4020**, the user selects the trend chart view (see **FIG. 14**) to review the trend of the stock in the national and after-hours markets. The user makes the decision, at step **4025**, to look at another stock in the detailed book view or chart view, and selects the stock from the stock summary display. The application transmits the user's request to the replica server, which transmits the requested information back to the user's application. This new

information is kept updated in real-time by the replica server. The application displays the new stock in the order book view, at step **4030**, and populates the trade ticket (see **FIGS. 5 & 11**). At step **4035**, the application displays news for the selected stock in the stock display. At step **4040**, the application highlights the user's position in the selected stock in the positions display. The application shows the alert status on the selected stock at step **4045**. The application also, at step **4050**, shows the selected help function in the background for the selected stock or security type. The application shows profit or loss, at step **4055**, if the user sells his position in the selected stock at the current level shown in the order book display (see **FIGS. 5 & 6**).

As noted, the invention may be used in negotiations between two users relating to the sale of a security. Display screens useful in such negotiations are set forth in **FIG. 41-48**.

FIG. 41 is the "Set defaults" display for the user-to-user negotiation mechanism of the preferred embodiment. This display allows the user to set parameters to screen out unreasonable (according the user's standards) counteroffers. The user inputs his desired parameters in the boxes **4105, 4110, 4115**, and **4120** under questions 1 through 4. In the box **4105** under line 1, the user inputs the price above and below his limit price within which he is willing to negotiate, in increments of sixteenths of a dollar. For example, if his limit price is $50 per share, and he is willing negotiate at prices between $49.75 and $50.25 per share (depending on whether the order is a buy or sell order), he would enter 0.25 into the box **4105** under question 1. The user enters the number of shares above or below his stated order size that he is willing to negotiate in the box **4110** under question 2. For example, if the user is offering to sell 100 shares, but would consider selling 80-120 shares, he would enter 20 in the box **4110** under question 2. If zero is entered, the order is an all-or-none order. This

negotiation floor and ceiling is expressed alternatively in percentages; see **FIG. 42**. The user enters his default preferred negotiation time in the box **4115** under question 3. For example, if the user would prefer to have 10 minutes to respond to any buy offers, he would enter "10 min." in box **4115**. The user enters the lower time limit he will accept in the box **4120** under question 4. For example, if the user would not consider any offers which require him to respond in less than 2 minutes, he would enter "2 min." in box **4120**.

The user sets the defaults for the incremental changes caused by clicking the adjustment buttons in the negotiations screen (see **FIG. 42**) by inputting the desired increment sizes into boxes **4125, 4130,** and **4135** under questions 5, 6, and 7. The user inputs the desired size incremental change to be caused by clicking the size change buttons ("Qty Up" and "Qty Down") (see **FIG. 42**) into the box **4125** under question 5. This size change is shown here in terms of number of shares; alternatively, the size change can be a percentage (see **FIG. 42**). The user inputs the desired time incremental change to be caused by clicking the time change buttons ("Time Up" and "Time Down") (see **FIG. 42**) into the box **4130** under question 6. The user inputs the desired price incremental change to be caused by clicking the price change buttons ("Price UP" and "Price Down") (see **FIG. 42**) into the box **4135** under question 7.

FIG. 42 is a negotiations screen. Users of the system can undertake direct, real-time on-line negotiations with other traders on the system. The purpose of the negotiations system is to permit traders to attempt to better the price of buying or selling stock as compared against the best bid and offer shown in the order book display. The negotiations screen has three main components: the "Traders at a price level"screen **4200**, the "Out-going negotiations" screen **4205**, and the "In-coming negotiations" screen **4210**. The traders listed

in the screen **4200** are called up by double-clicking on a quantity away from the best bid and offer shown in the order book display (see **FIG. 25**). The price corresponding to the quantity double-clicked in the order book display is the price listed in the "Price" column **4260** of the negotiations display traders screen **4200**. In the example shown in **FIG. 42**, that price is 52.5. The numbers **4215** in parentheses adjacent to the best price amounts are the numbers entered by the traders designating the price above/below their limit price at which they are willing to negotiate. In the example shown, Fred D. is willing to negotiate within 3/16 (0.1875) of 52.5. Analogously, the numbers in the Qty column represent the number of shares each seller is offering for sale, and the numbers **4220** in parentheses adjacent to the share numbers have been entered by the sellers to designate the variation from the stated number of shares with respect to which they are willing to negotiate. Thus Fred D. is offering to sell 200 shares, but he might be willing to sell between 160 and 240 shares. The numbers in the "Time" column have been entered by the sellers, and designate their preferred negotiation times. The numbers **4225** in parentheses designate the lower time limit each trader will accept. The numbers in the "Activity" column **4230** represent the trader's level of trading activity in the selected stock. The numbers are in the set {0, 1, 2, 3, 4}, where 0 means that the trader has never negotiated a trade in that stock and 4 means that the trader is among the most active traders in that stock. The P/L-BBO column **4284** displays the user's loss or gain as compared to the current best bid or ask for the stock being negotiated. The price buttons **4240**, the size buttons **4245**, and the time buttons **4250** are located near the bottom of the negotiations display. Default incremental changes are set in the "Set defaults" screen (see **FIG. 41**) (the "Set defaults" screen is called up by clicking the "Set defaults" button **4235**). Incorporated in the negotiation interface is a "Speed Function": if the user holds down the Shift key while

selecting a trader, the application populates the trade window with the lowest acceptable values for the selected trader. This feature reduces typing and starts the negotiations at the lower limits. For example, the minimum values for Larry 22 are 52 (52.5 - 0.5), 500 (1000 - 50% of 1000), and 2 minutes (the lowest time limit he will accept). To initiate negotiations with a given trader, the user double-clicks on the trader line **4255** in the trader screen **4200**. In the example shown, the selected trader is Larry 22. The "Best offer" button **4265** is used to arrange the order of the listed buyers or sellers according to the ones which most closely satisfy criteria set by the user. Available parameters include: widest price variation counteroffer; most time allowed; and highest activity level. A "not-to-exceed" field can be selected to limit order size above or below a certain amount. The button **4270** adjacent to the "Best offer' button displays a price 1/16 lower, in this case, from the listed price (52.5). The user can click button **4270** to have the application display parties selling at 52.438. This improves the trading efficiency of the user by not requiring him to return to the order book display and click on a different price. The three buttons to the right of button **4270** work the same way. The "Sort" button **4275** allows the user to specify the parameters according to which the traders are listed; for example, according to price, quantity, or time. The "FIND" bar **4214** at the bottom of the negotiations screen allows a user to modify the negotiations screen display without having to return to the order book display. Clicking on the "Action" button **4216** creates a pop-up menu with the choices "Buy" and "Sell." Clicking the "Stock" button **4222** creates a pop-up menu listing recently checked stocks, along with a box into which the user can input the symbol of a stock not displayed. Entering or selecting a stock pulls up a display of trades in that stock. The first price level displayed is that of one price increment away from the best bid and offer (BBO) as shown in the order book. The user can select price increments above or below the first increment by selection of the price increment

buttons. Clicking the "Trader" button **4232** creates a pop-up menu with a box into which the user can input the name of a trader of interest. The application will display the selected trader's current limit order or outstanding negotiations in all stocks in which the trader has limit orders posted. Clicking the "Trader list" button **4242** creates a pop-up "hot list" of traders. This hot list is created by the user using the "Add" button **4252** and the "Delete" button **4262**. Clicking the "Add" button **4252** after the user has typed in the name of a trader using the "Trader" button **4232** adds that trader's name to the "Trader list." Also, if a user has highlighted a trader's name in the "Traders at a price level" display **4200**, that user's name is added to the "Trader list" when the "Add" button **4252** is clicked. Clicking the "Delete" button **4262** when a trader's name in the "Trader list" removes that trader's name from the Trader list. When the user highlights a selection of trader names in the Trader list and hits "Enter," the "Traders at a price level" screen **4200** displays the selected traders and the selected stock, along with those traders' outstanding offers in that stock.

When a user enters a limit order by using the trade ticket, he has the option (by checking the "Negotiations allowed" box on the trade ticket display – see **FIG. 11**) to allow negotiations or not. If the user checks the "Negotiations allowed" box, the application will allow the user's order to appear in the negotiations screen. If the "Negotiations allowed" box is not checked, the user's order will not be displayed in the negotiations screen.

The "Broadcast" button **4212** permits a user to send the same offer to more than one trader. The first trader to respond is the one with whom the user negotiates. The user selects the traders to whom the offer will be sent by highlighting their names in the "Traders at a price level" screen **4200**.

FIG. 43 shows how the negotiation screen 4200 fits into the master trade screen (see FIG. 5). The user requests the negotiation display by selecting a negotiation button 1530. In response, the application displays at 4200 the negotiation screen as discussed in connection with FIG. 42.

FIG. 44 illustrates how a user adjusts the values in his counteroffer. Once Larry 22's trader line 4255 has been selected and double-clicked, a copy 4415 of his trader line appears in the Out-going Negotiations screen 4205. The activity level of the trader is displayed, along with the identity 4425 of the stock to which the activity level refer. This helps the user keep clear which stock he is making offers and counteroffers on, and is especially helpful when several offers on different stocks have been made. The user in the example illustrated in FIG. 44 is RON-3, and the "counter-line" below Larry 22's line 4415 is highlighted in yellow and automatically pre-filled with the user's name and related data. If the Speed Function is used (by holding down the Shift key when line 4255 is double-clicked), the counter-line is filled with Larry 22's minimum values.

The size change buttons 4240 are used to adjust the value 4410 displayed in the user's counter-line 4405. The size buttons 4245 are used to adjust the number of shares 4420 displayed in the user's counter-line 4405. The time buttons 4250 are used to adjust the time values 4430 displayed in the user's counter-line 4405. The numbers shown in parentheses in the user's counter-line are the default values set in the "Set defaults" display (see FIG. 41). The user can adjust these values by directing typing over them in the counter-line 4405.

FIG. 45 illustrates how the application displays the potential effect of a user's counteroffer. Once the price, quantity, and time parameters are set for the user's counteroffer, the application displays the cost 4520 of the user's proposed transaction (if the transaction is

a purchase; if the transaction is a sale, the price to be received for the shares would be displayed – see **FIG. 47**). The number 93.50 **4725** in the P/L column is the difference between what the user would pay at the best ask price displayed on the system and what the user would pay at the price per share in that negotiations row. In the example shown, the best ask price per share is assumed to be 52.187. Thus, if the user buys 500 shares at 52, he will **4725** pay $93.50 less than he would have paid at the best bid price.

FIG. 46 illustrates how an offering trader responds to a user's counteroffer. The trader in the example, Larry 22, has made a counteroffer **4610** ("Counter 2") to the user's Counter 1 offer. Larry 22 has responded with an offer to sell at 52.25 **4615** instead of 52, to sell 800 shares **4620** instead of the 500 the user offered to buy, and has specified a response time **4625** of 1 minute. The application displays Larry 22's level of trading activity **4640**, and displays the amount **4630** the user would have to pay to accept Larry 22's counteroffer.

FIG. 47 illustrates how a user makes an offer to sell and then receives buy counteroffers. In the example, the user is RON-3. The user has made a sell offer **4710**, which is displayed in the In-coming negotiations screen **4210**. The user is offering to sell 2000 shares of the stock whose symbol is "T" **4750**, at a price per share of 152.5, and would prefer to have 10 minutes to consider counteroffers. Further, the user is only willing to consider counteroffers of 152 per share or above, of at least 1000 shares, and demands at least 2 minutes to consider such offers. If the user's offer to sell is accepted as is, the user would sell his 2000 shares for $305,000. The number 1,567 **4725** in the P/L column is the difference between what the user would receive at the best bid price displayed on the system and what the user would receive at the price per share in that negotiations row. In the example shown, the best bid price per share is assumed to be 153.284. Thus, if the user sells

his 2000 shares at 152.5, he will 4725 receive $1,567.00 less than he would have received at the best bid price. The counteroffer **4720** has been made by Fred 4U. He is offering to buy 1000 shares at 152 per share and requests a response in 2 minutes. Note that these are the minimum values of the user's offer, so Fred 4U may have used the speed function to initiate his counteroffer. The application has calculated the dollar amount of Fred 4U's counteroffer and displayed that value in the "Total $" column.

FIG. 48 illustrates how the preferred embodiment enables a user to conduct more than one in-coming negotiation and more than one out-going negotiation simultaneously. In the example shown, the user, RON-3, has an out-going negotiation **4810** with Larry 22 on shares of IBM stock. The user also has an out-going negotiation **4820** with Frank5 on shares of DELL stock. At the same time, the user has two in-coming negotiations. The first is a negotiation **4830** with Fred 4U for shares of T stock. The second in-coming negotiation **4840** is with David44 for shares of YHOO stock. Although it would be obvious to one of ordinary skill in the art to modify the preferred embodiment to enable a user to conduct more than 4 negotiations at once, the preferred embodiment is restricted to displaying only two incoming and two outgoing negotiations so as to maximize the trading efficiency of the user.

FIGS. 48A and **48B** show a flow diagram illustrating how the system enables one user to negotiate with another user. Step **4832** involves a seller activating the application and viewing the order book for a particular stock. This done the same as for a standard buy or sell order, by following steps **310** through **338** as described in **FIG. 3**. At step **4842**, the seller wishes to sell 1000 shares of IBM at $50.25 per share. The user fills in the trade ticket **510** with the relevant information, and checks the box for "Negotiations allowed" **1175**. The seller then the send order button (the "Verification" button **1110**). The final verification

screen is displayed at step **4844**, and the seller selects the "Send' order button. At step **4846** the seller's order is transmitted to the seller's broker/dealer server/database, which checks that seller has at least 1000 shares of IBM available to sell. The broker/dealer server/database sends the approved sell order (with a user account ID and the size, price, stock, and side (whether buy or sell) of the order) to the root server **50**, which attaches a system ID to the order, said system ID containing sufficient information to enable the system to match the ID to the seller, the order, and the seller's broker/dealer. At step **4852**, the root server accepts the seller's order and updates the IBM order book in the master database to reflect the seller's order. The updated order book is transmitted at step **4854** to the replica servers **30**, which update the replica databases. At step **4856**, each replica server/database with connected users which subscribe to the IBM order book sends seller's sell offer (along with the system ID of the seller's offer), along with any other updated order book information, to the IBM subscribers' applications. At step **4858**, the applications which receive the seller's sell offer display that offer in the context of the IBM order book display. At step **4862**, a buyer sees from the IBM order book display that the best ask price for IBM is 50 3/16, but there is only one offer at that price, the offer is to sell only 200 shares, and the buyer wishes to buy 1000 shares of IBM. At step **4864**, the buyer sees in the order book display that there are more than 1000 shares for sale at 50.25. The sell orders at 50.25 are aggregated in the order book display, and the seller's order is included in that aggregation. At step **4868**, the buyer decides to try to negotiate, so he clicks on the price $50.25 in the order book display. The negotiations screen **4200** is displayed at step **4872**, with sell offers of IBM stock at $50.25 displayed, including the seller's offer to sell 100 shares of IBM at $50.25. At step **4874**, the buyer clicks on the seller's offer that is displayed in the negotiations screen. The seller's offer is then re-displayed in the out-going negotiations display **4205** in line **4280**. At step

4876 the buyer enters a counteroffer to seller's offer into the line 4285 below the seller's offer as displayed in line 4280, offering to buy 1000 shares of IBM stock at 50 3/16. The buyer then selects the "Send" button at step 4882 to send his counteroffer to seller. At step 4882 the application sends the buyer's counteroffer to the buyer's broker/dealer server/database, which then checks the amount of uncommitted funds in the buyer's account and sends the buyer's account limit information back to the application. The application at step 4884 checks to see whether the buyer's counteroffer is permissibly under the limits on the buyer's account. At step 4886, if the buyer's counteroffer is determined by the application to be acceptable, the application transmits the buyer's counteroffer to the replica server, along with the system ID of the seller's offer and the broker/dealer account ID for buyer. The replica server at step 4888 transmits the buyer's counteroffer, seller's offer's system ID, and buyer's broker/dealer account ID to the root server, which then updates the IBM order book in the master database and assigns a system ID to the buyer's counteroffer. The updated order book information, including the buyer's counteroffer to seller and the system ID for seller's offer, is then transmitted at step 4890 to the replica servers, which update the replica databases. The replica server connected to seller transmits buyer's counteroffer to seller's application, along with the system IDs of the seller's offer and the buyer's counteroffer. At step 4892, the seller's application displays the buyer's counteroffer as an incoming negotiation and the seller accepts the buyer's offer by selecting the "Accept" button (see FIG. 47). If the buyer's counteroffer has affected the prior account approval of seller's offer by the seller's broker/dealer (say, e.g., that buyer had offered to buy 2000 shares and seller accepted), seller's acceptance would be first be routed to seller's broker/dealer for approval before the application would transmit the acceptance to the replica server. At step 4894, the seller's acceptance order, including the system IDs of the seller's original offer and the buyer's

counteroffer, is transmitted by the seller's application to the replica server **30**, which transmits the order to the root server **50**. At step **4896**, the root server updates the master database, including the IBM order book; uses the system IDs of the buyer's counteroffer and the seller's original sell offer to notify the seller's broker/dealer server and the buyer's broker/dealer server of the nature of the approved transaction; and transmits updated order book information to the replica servers. Step **4998** is the final step of closing the transaction, and is the same as steps **394** and **398** of **FIG. 3**. In an alternate embodiment of the negotiations system and method, all buy sell orders and all offers and counteroffers are routed through and approved by the broker/dealer(s) in a manner analogous to that described in **FIG. 3**.

Several additional displays that are useful in the practice of the invention are shown in **FIG. 49-62**.

FIG. 49 is a "most viewed stocks" display. The most viewed stocks display is displayed in the same part of the master trade screen as the order book display, the multiple pricing map display, and the chart of stock activity display (see also **FIG. 57B**). The bars **4910** represent the number of participants in the system who have recently viewed the listed stocks. As a default, the stocks are listed in descending order of the number of shares traded in the most recent period. The user can enter the symbol into the box **4920** of a stock of interest that is not displayed in order to have that stock displayed at the top of the Most viewed stocks display. The advantage of the most viewed stocks display is that it enables a user to determine what stocks other users have been checking. This in turn aids the user to determine, for example, what stocks he needs to be searching for news reports on.

FIG. 50 is a fully compressed view of the GUI of the application (see **FIG. 16**). A frequent problem with current on-line trading systems is the need for the user to open up an entire browser to view the status of stocks of interest. Such a process wastes time and requires the user to rearrange his screen work space or cover other work while viewing the status of stocks of interest. **FIG. 50** shows the fully compressed stock display that can be displayed on the user's screen at all times while not obstructing the user's workspace. The component is a real-time display that shows the current status of user-defined stock portfolios, indexes, or any other electronically delivered status indicators. The "On Line" indicator **5005** shows whether or not the user is connected to the system. If the "Help" button **5010** is selected, context-sensitive help data is displayed. Selection of a stock followed by selection of the "Trade" button **5015** opens the master trade screen to the fully expanded position with the selected stock shown in the order book and the trade ticket populated. Selecting the "Quote" button **5020** calls up the "Quick Quote" screen (see **FIG. 51**). The "News" button **5025** flashes if news is out on any stocks on which alerts have been set. The "Messages" button **5030** flashes when the user has e-mail messages, and clicking the button opens the e-mail window. Clicking the "Expand" button **5035** opens the stock summary display (see **FIG. 16**) and closes the compressed display. Clicking the "Close" button **5040** closes the compressed display and closes the application. Rows **5050** and **5060** display three stock data fields each. The user can type a stock symbol in a data field and receive current status information on that stock. The fields can contain stocks, mutual funds, bonds, any security, index, or related variable. If the user has set visual alarms for a stock displayed in a data field, the background of that field will highlight based on user-defined criteria.

FIG. 51 shows a "Quick Quote" display. The default display 5100 is called up when the user selects the 'Quick Quote" button from the function button display (see, e.g., FIG. 5). The user types the symbol for the desired stock in the box 5114 and selects the "Show quote" button 5112 to have data on the stock displayed in the screen 5120. If the user selects the "Trade ticket" button 5126, the trade ticket 510 is pre-filled with the appropriate data on the selected stock, including the user's positions if applicable. If the user selects the "Add to wish lst." button 5128, the stock is added the user's wish (watch) list for further monitoring. If the user selects the "New Quote" button 5122, an empty quote screen 5100 is displayed. If the user selects the "Show News" button 5124, the news window is opened and news on the selected stock is displayed. If the user does not know the correct symbol for the stock, he can enter the name of the company into the box 5116, and then click on the "Find symbol" button 5118. If the company name is not a perfect match with one listed in the master database of the system, the screen 5140 is displayed, with the closest matches 5148 to what the user has typed in displayed. The scroll bar 5150 allows the user to scroll up and down the list of companies. The "New Search" button 5144 calls up the screen 5100. If a company name is selected from the list, the "Show quote" button 5146 calls up the screen 5120, with the stock data for the selected company displayed.

FIG. 52 shows a "Stock alert set up" display, which allows a user to track the movement of selected stocks. The user calls the stock alert set up display by selecting the "Alerts" button 1525 in the function button display (see FIG. 15). If a stock is first selected from the stock summary display (see FIG. 12) and then the "Alerts" button is selected, the "Stock alerts set up" screen is pre-filled with information from the user's positions and the current status of the stock in the market. If the stock symbol is not pre-filled into the box

5210, the user inputs the symbol for the stock of interest. Once the symbol is input, the current price 5212 of the stock is automatically filled in by the application. The user inputs the price at which he wants to be alerted in the box 5215. The user selects the method by which he wishes to be alerted in the column 5220, by checking the appropriate box 5222. Available options include: pager, email, fax, and phone. The user enters his pager number in the box 5230; his email address in the box 5232; his fax number in the box 5234; and his phone number in the box 5236. If the user selects "Type of Alerts" 5240 and then "visual alerts," the user can have the application highlight the stock in the stock summary display according to various criteria: direction of movement, rate of movement, profit/loss against the user's current positions. The visual alert works on several of the displays where the stock symbol occurs. The "Other criteria" button 5260 calls up a list of alert criteria options for tracking the status of the stock of interest. The "New alert" button 5242 clears the screen for the input of a new stock symbol or new alert parameters. The "Clear alert" button 5244 cancels an alert that has already been set. The "OK" button 5250 records the alert that has been set and removes the "Stock alert set up" screen.

FIG. 53 shows a connection status indication display. Current on-line trading systems do not provide users with a clear, concise status indication of the initial connection process as they log on to the trading system. The connection status display 5300 of the preferred embodiment shows users each step of the connection process. The first connection status indicator 5320 "Connecting to [the trading system]," is indicated by the button 5325 being lit while the connection to the trading system is being established. When the connection is established, the button 5335 opposite the "Connection established" label 5330 is lit. When the application is initialized, the button 5345 opposite the "Application initialized" label 5340

is lit. Once the application is initialized, the message **5350** "Initialization complete!" is either displayed (if not displayed already) or highlighted (if already displayed). The user's name and password input areas do not appear until the connection to the network is established. The user then enters his user name in the box **5365** opposite the "Enter your user name" label **5360**. The user also enters his user password in the box **5375** opposite the "Enter your password" label **5370**. The user then clicks the "OK" button **5380** to submit his login information to the system and to close the connection status screen. If the user encounters problems connecting, he can access the context-sensitive help function, including detailed problem FAQs and a troubleshooting index, by clicking the "HELP" button **5390**.

FIG. 54 shows a compressed spread display (see **FIG. 6**). The compressed spread screen is called up by clicking the "Compress spread" button **656**. The "Compress spread" button **656** compresses the spread, and orders included in the spread, down to one line. The horizontal bar **5460** representing the compressed spread is red. The compressed view shows the last bid, best offer, and a single line spread shown on a red background with white characters. The quantity shown in the red bar is the total price of the spread in one line. "All or none" orders **5440** and **5450** contained within the spread are shown as total amounts. The magnitude **5430** of the spread is displayed numerically in the center of the bar **5460**. The magnitude of the spread is displayed graphically by the vertical bar **5410** on the right side of the display.

FIG. 55 shows an email display. The email display is displayed within the web browser of the application (see **FIG. 10**). The "Show news" button **5520** is clicked to return to the news display of the browser. The "Show Email" button **5510** is clicked to go from the news display to the email display.

FIG. 56 shows a "Final Verification" screen. The dark area **5610** flashes to alert the user to the significance of completing this step. A real-time quotation **5670** for the selected stock is displayed. The user's buying power **5640** is displayed, along with **5650** what his balance will be if the trade is executed and what the corresponding commission **5630** will be. The total cost **5620** of the trade is displayed at the bottom of the screen in color-coded characters.

FIG. 57 shows an analog graphic display for viewing the price of a stock on several markets at one time (see **FIG. 39**). The price scale **5710** is at the left. The numbers 1 **5720**, 2 **5730**, and 3 **5740** represent markets 1, 2, and 3.

FIG. 57A is a "Most Active Stocks" display. The most active stocks in both the Day market (NM) and the Nite Market (AHM) are shown. The scroll bar **5782** allows the user to scroll up and down the list of most active stocks.

FIG. 57B shows how the most viewed stocks display shown in **FIG. 49** is displayed in the same screen as the Order book display, chart display, and most active stocks display.

FIG. 57C shows a multi-screen view created by the "Peel off display" function (see **FIG. 27**).

In an alternate embodiment of the disclosed system, instead of being in a stand-alone application, the GUI is displayed within an Internet web browser, and the application is a Java applet. In the applet version, no software remains resident on the user's computer when the system is not being accessed. The functionality of the various components of the GUI remains essentially the same, except for routine modifications (for example, some functionality may be scaled back to reduce the size and download time of the applet). In each display, the scalable price map display (see **FIG. 14**) is on the right-hand side.

FIG. 58 shows an applet version of the real-time chart of stock activity display shown in FIG. 15.

FIG. 59 shows an applet version of the most active stocks display shown in FIG. 57A.

FIG. 60 shows an applet version of the most viewed stocks display shown in FIG. 57B.

FIG. 61 shows an applet version of the order book display shown in FIG. 6.

FIG. 62 shows an applet version of the news display shown in FIG. 10.

In a further alternate embodiment of the disclosed system, either the entire master trade screen display (see FIG. 5), or individual displays (e.g., the order book display, shown in FIG. 6, or the displays shown in FIGS. 58 - 62), are presented in static versions on the Internet. These static versions of the primary market displays are presented in the form of "graphic snapshots" in a standard format such as GIF. These snapshots are transmitted and displayed in standard HTML pages without the need to call Java applets or to utilize other secondary implementation strategies. This allows the displays to be widely distributed over the Internet without requiring users to have the latest updated browsers. It further allows for very wide distribution of the market indications to a broad audience such as would be available at a portal or other high-traffic website.

Other embodiments of the disclosed system will be clear to those skilled in the art.

The present invention is not to be limited in scope by the specific embodiments described herein. Indeed, modifications of the invention in addition to those described herein will become apparent to those skilled in the art from the foregoing description and accompanying figures. Doubtless, numerous other embodiments can be conceived that would

FIG. 56 shows a "Final Verification" screen. The dark area **5610** flashes to alert the user to the significance of completing this step. A real-time quotation **5670** for the selected stock is displayed. The user's buying power **5640** is displayed, along with **5650** what his balance will be if the trade is executed and what the corresponding commission **5630** will be. The total cost **5620** of the trade is displayed at the bottom of the screen in color-coded characters.

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WEST

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Other embodiments of the disclosed system will be clear to those skilled in the art.

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WEST

not depart from the teaching of the present invention, which scope is defined by the following claims.

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CLAIMS

What is claimed is:

1. A computer system supporting user-to-user computer trading of securities by users communicating from user devices over a first network with the system, comprising:

a root server supporting a master database comprising stored data representing offers to buy and offers to sell securities provided by the users of the system, the server includes software that updates the master database based on the offers to buy and the offers to sell securities provided by the users; and

replica servers communicating with the root server over a second network and with computer devices of the users over the first network wherein each of the replica servers includes:

a) essentially a copy of the master database;

b) software for communicating data to a user device, including software for communicating in essentially real-time updates to the offers to buy and the offers to sell stored for a security without receiving a request from the user for each new update;

c) software for receiving data representing a user's offer to buy or sell a security from the user device;

d) software for transmitting the data representing the user's offer to the root server; and

e) software for updating the master database in response to the received user's offer.

2. The system of claim 1 further comprising software for updating essentially a copy of the master database at one of the replica servers.

WEST

3. The system of claim 2 wherein the software for updating the copy comprises software for receiving the offer from the root server and updating the database on the basis of the user's offer.

4. The system of claim 1 further comprising a load balancer which monitors the replica servers and connects a new user to one of the replicated servers such that there is a substantial uniform load on the replica servers.

5. The system of claim 1 further comprising software for providing communication between the root server and a broker/dealer system of the user.

6. The system of claim 1 wherein the servers are arranged hierarchically so that the root server is connected to a plurality of intermediate servers at a first level of hierarchy and each of the intermediate servers at the first level of hierarchy are connected to the plurality of replica servers at a second level of hierarchy.

7. A method for facilitating delivery of real-time information relating to a security to a user communicating from a user workstation with a computer system comprising:

receiving updated security information at a root server;

updating a master database of the root-server in accordance with the updated security information;

communicating the updated security information to a plurality of replica servers;

updating essentially copies of the master database stored at the plurality of the replica servers in accordance with the updated security information; and

transmitting from one of the replica servers to the workstation of the user information for one or more securities requested by the workstation of the user including the updated security information.

8. The method of claim 7 wherein the user workstation communicates with one of the replica servers over the Internet.

9. The method of claim 8 further comprising establishing a communication between the user workstation and a load balancer of the system

10. A method of trading securities on a user-to-user trading system comprising:

(a) electrically receiving over a network a request from a first user to view offers to purchase and offers to sell a first security;

(b) electronically transmitting over the network to the first user data representing the offers to purchase and the offers to sell the first securities made by some of the users of the system;

(c) electronically updating the data representing the offers to purchase and the offers to sell the first security in response to a new offer to purchase or a new offer to sell the first security received over the network, and transmitting the updated data to the first user, without receiving a request for updated data from the first user; and

(d) electronically receiving an acceptance of one of the offers to sell from the first user and in, response, electronically updating the data representing the offers to sell.

WEST

11. The method of claim 10 further comprising storing the data representing the offers to sell and the offers to purchase at a plurality of replica servers connected by a network to the root server.

12. The method of claim 11 wherein the step (c) of electronically updating further comprises:

(a) electronically receiving the new offer from a second user at a replica server to which the second user is connected;

(b) electronically providing the new offer from the replica server to the root server;

(c) electronically updating the master database stored at the root server based on the new offer;

(d) electronically providing the new offer to the replica servers; and

(e) updating databases stored at the replica servers based on the new offer.

13. The method of claim 10 further including receiving a request from a second user to negotiate purchase price of the first securities offered by the third user and electronically establishing a negotiation between the second and the third users.

14. A computer program for providing a computer interface which facilitates security trading by a user communicating over a network with at least one computer system, the interface comprising simultaneously displayed non-overlapping computer displays which include: (a) a computer display of user's current security positions, (b) a computer display of an open order list of the user, (c) a computer display of a trade ticket, (d) a computer display

WEST

of a watch list of securities wherein a price of at least one of the securities displayed in the watch list is automatically updated without the user requesting each update.

15. The program of claim 14 further providing a computer display of offers to buy and offers to sell the securities.

16. A computer method of providing a computer interface which facilitates electronic security trading by a user communicating over a network with at least one computer system, comprising: (a) graphically displaying bid, ask, and spread for a security in active trading in a first market; and (b) simultaneously graphically displaying a trade for the security in a second market in such a manner that a value of the trade in the second market can be readily visually compared with the bid, ask, and spread in the first market.

17. The method of claim 16 further comprising displaying an alphanumeric summary of the user's average price of the security and the user's current profit or loss for the security based on the current price of the security.

18. A method of presenting information about market conditions to a user at a user workstation networked to at least one server comprising:

displaying numerical information representing detailed trading data for a security in a first market;

displaying a summary graphical display representing summary trading information for the security in the first market; and

displaying graphical information on the summary display representing position of the security in a second market.

19. The method of claim 18 further comprising graphically displaying data representing user's holdings of the security on the summary display.

20. The method of claim 19 further comprising displaying user's P&L in the security.

21. A method of claim 18 further comprising updating the trading data for the security in real-time without a user requesting updates.

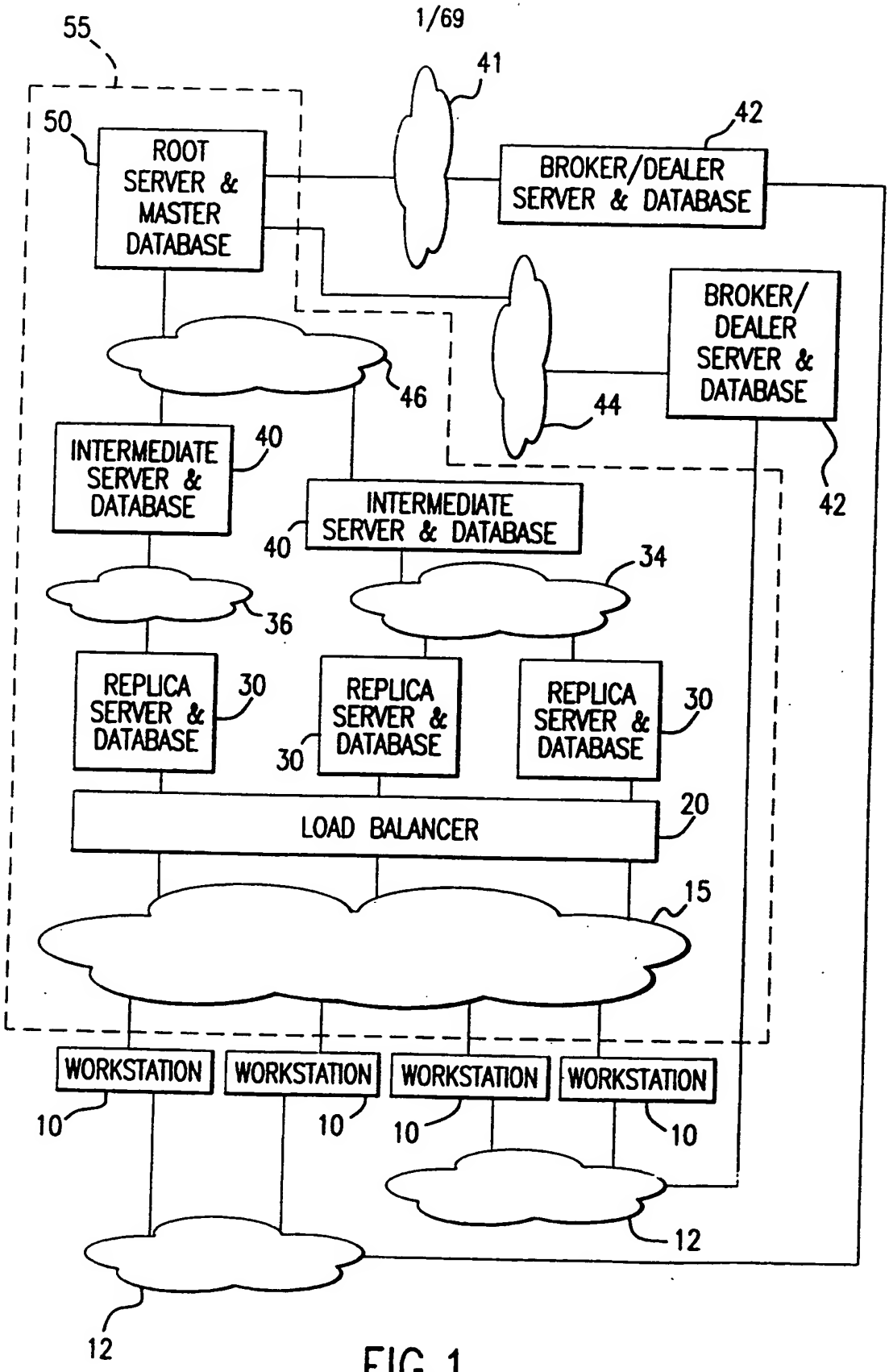

55
41
50
ROOT SERVER & MASTER DATABASE
42
BROKER/DEALER SERVER & DATABASE
BROKER/ DEALER SERVER & DATABASE
46
44
INTERMEDIATE SERVER & DATABASE
40
INTERMEDIATE SERVER & DATABASE
40
42
34
36
REPLICA SERVER & DATABASE
30
REPLICA SERVER & DATABASE
30
REPLICA SERVER & DATABASE
30
LOAD BALANCER
20
15
WORKSTATION
WORKSTATION
WORKSTATION
WORKSTATION
10
10
10
10
12
12

FIG. 1

WEST

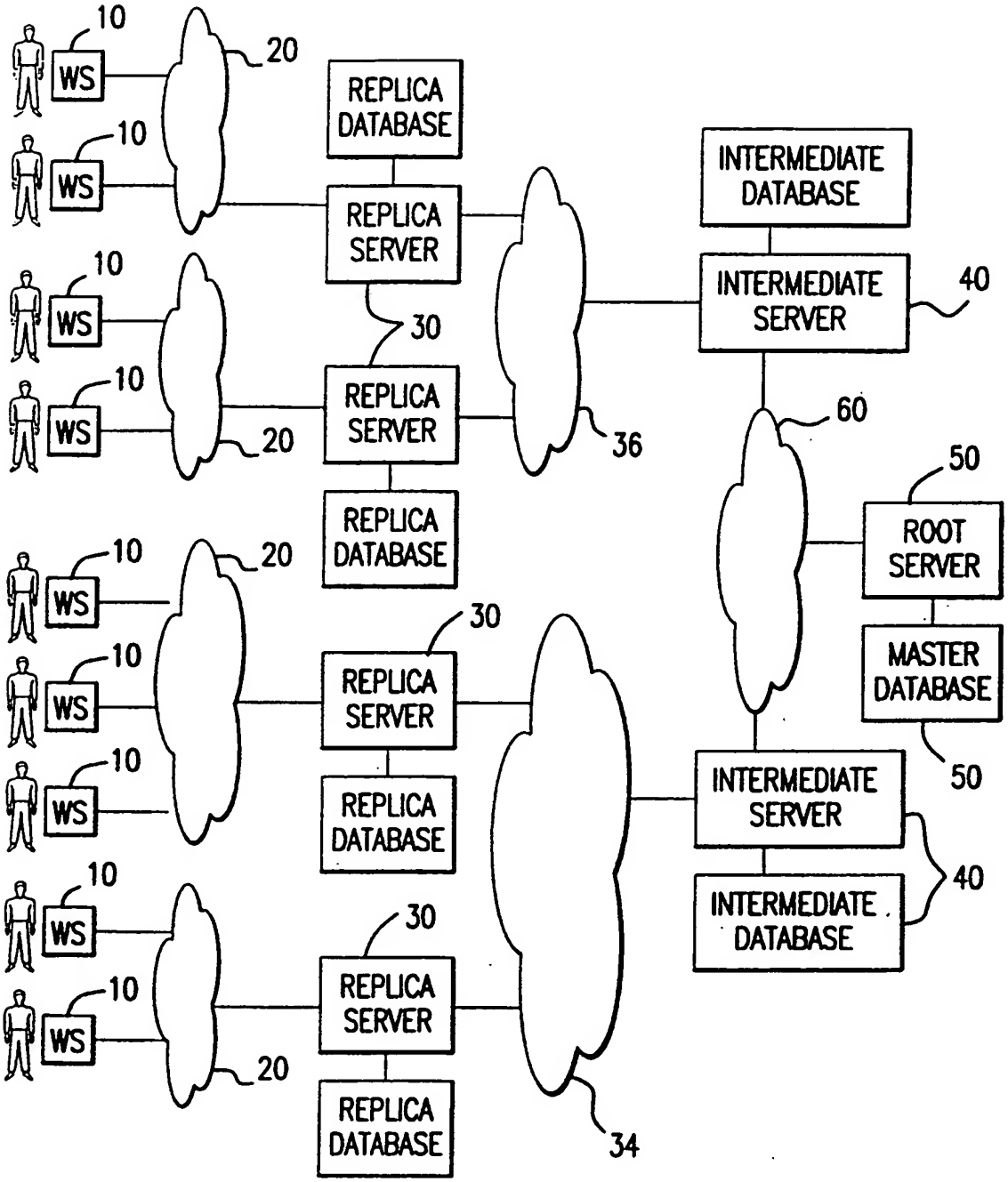

10
WS
20
REPLICA DATABASE
REPLICA SERVER
30
INTERMEDIATE DATABASE
INTERMEDIATE SERVER
40
36
60
50
ROOT SERVER
MASTER DATABASE
34

FIG.2

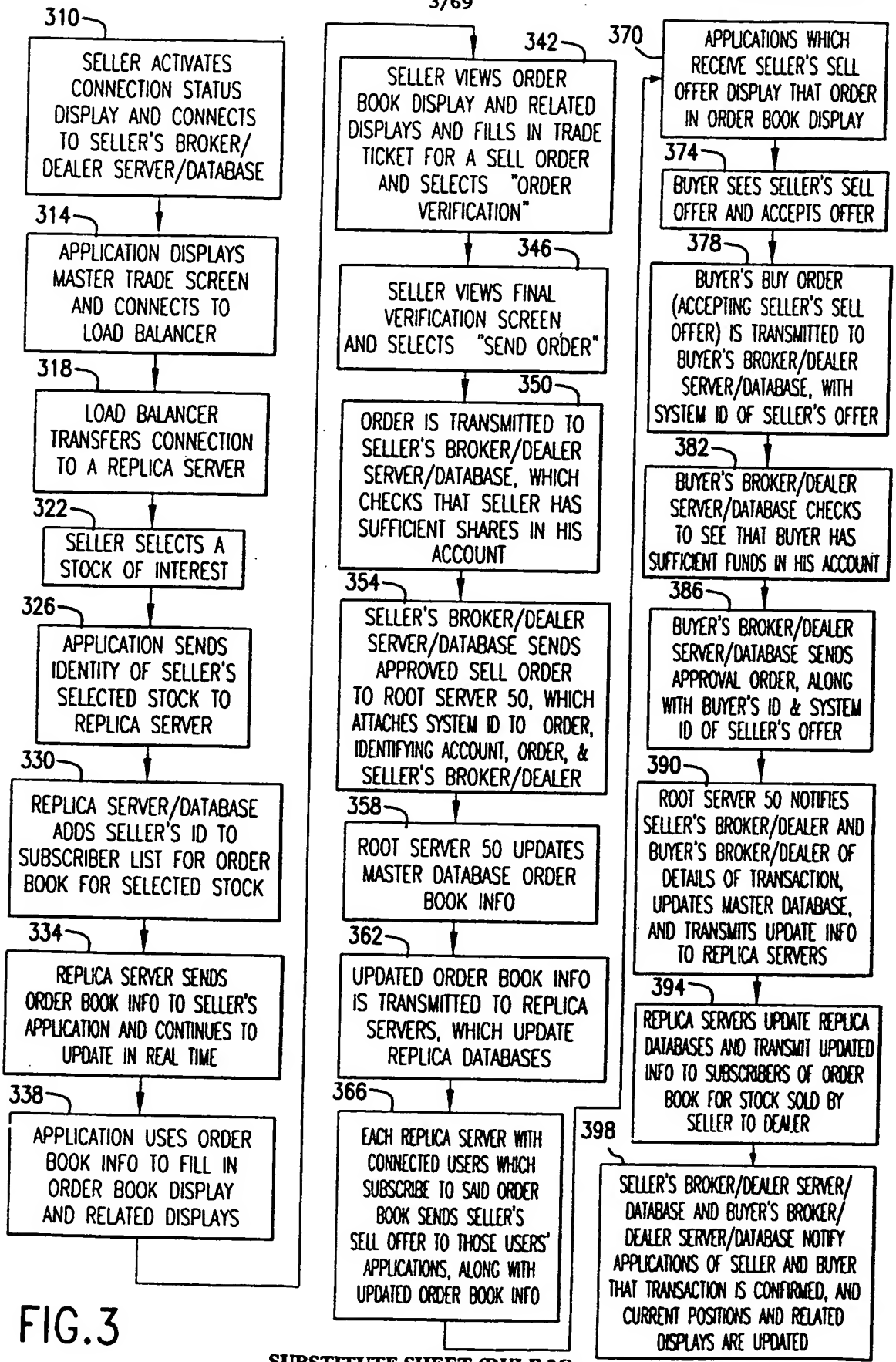

310
SELLER ACTIVATES CONNECTION STATUS DISPLAY AND CONNECTS TO SELLER'S BROKER/ DEALER SERVER/DATABASE
314
APPLICATION DISPLAYS MASTER TRADE SCREEN AND CONNECTS TO LOAD BALANCER
318
LOAD BALANCER TRANSFERS CONNECTION TO A REPLICA SERVER
322
SELLER SELECTS A STOCK OF INTEREST
326
APPLICATION SENDS IDENTITY OF SELLER'S SELECTED STOCK TO REPLICA SERVER
330
REPLICA SERVER/DATABASE ADDS SELLER'S ID TO SUBSCRIBER LIST FOR ORDER BOOK FOR SELECTED STOCK
334
REPLICA SERVER SENDS ORDER BOOK INFO TO SELLER'S APPLICATION AND CONTINUES TO UPDATE IN REAL TIME
338
APPLICATION USES ORDER BOOK INFO TO FILL IN ORDER BOOK DISPLAY AND RELATED DISPLAYS
342
SELLER VIEWS ORDER BOOK DISPLAY AND RELATED DISPLAYS AND FILLS IN TRADE TICKET FOR A SELL ORDER AND SELECTS "ORDER VERIFICATION"
346
SELLER VIEWS FINAL VERIFICATION SCREEN AND SELECTS "SEND ORDER"
350
ORDER IS TRANSMITTED TO SELLER'S BROKER/DEALER SERVER/DATABASE, WHICH CHECKS THAT SELLER HAS SUFFICIENT SHARES IN HIS ACCOUNT
354
SELLER'S BROKER/DEALER SERVER/DATABASE SENDS APPROVED SELL ORDER TO ROOT SERVER 50, WHICH ATTACHES SYSTEM ID TO ORDER, IDENTIFYING ACCOUNT, ORDER, & SELLER'S BROKER/DEALER
358
ROOT SERVER 50 UPDATES MASTER DATABASE ORDER BOOK INFO
362
UPDATED ORDER BOOK INFO IS TRANSMITTED TO REPLICA SERVERS, WHICH UPDATE REPLICA DATABASES
366
EACH REPLICA SERVER WITH CONNECTED USERS WHICH SUBSCRIBE TO SAID ORDER BOOK SENDS SELLER'S SELL OFFER TO THOSE USERS' APPLICATIONS, ALONG WITH UPDATED ORDER BOOK INFO
370
APPLICATIONS WHICH RECEIVE SELLER'S SELL OFFER DISPLAY THAT ORDER IN ORDER BOOK DISPLAY
374
BUYER SEES SELLER'S SELL OFFER AND ACCEPTS OFFER
378
BUYER'S BUY ORDER (ACCEPTING SELLER'S SELL OFFER) IS TRANSMITTED TO BUYER'S BROKER/DEALER SERVER/DATABASE, WITH SYSTEM ID OF SELLER'S OFFER
382
BUYER'S BROKER/DEALER SERVER/DATABASE CHECKS TO SEE THAT BUYER HAS SUFFICIENT FUNDS IN HIS ACCOUNT
386
BUYER'S BROKER/DEALER SERVER/DATABASE SENDS APPROVAL ORDER, ALONG WITH BUYER'S ID & SYSTEM ID OF SELLER'S OFFER
390
ROOT SERVER 50 NOTIFIES SELLER'S BROKER/DEALER AND BUYER'S BROKER/DEALER OF DETAILS OF TRANSACTION, UPDATES MASTER DATABASE, AND TRANSMITS UPDATE INFO TO REPLICA SERVERS
394
REPLICA SERVERS UPDATE REPLICA DATABASES AND TRANSMIT UPDATED INFO TO SUBSCRIBERS OF ORDER BOOK FOR STOCK SOLD BY SELLER TO DEALER
398
SELLER'S BROKER/DEALER SERVER/ DATABASE AND BUYER'S BROKER/ DEALER SERVER/DATABASE NOTIFY APPLICATIONS OF SELLER AND BUYER THAT TRANSACTION IS CONFIRMED, AND CURRENT POSITIONS AND RELATED DISPLAYS ARE UPDATED

FIG.3

WEST

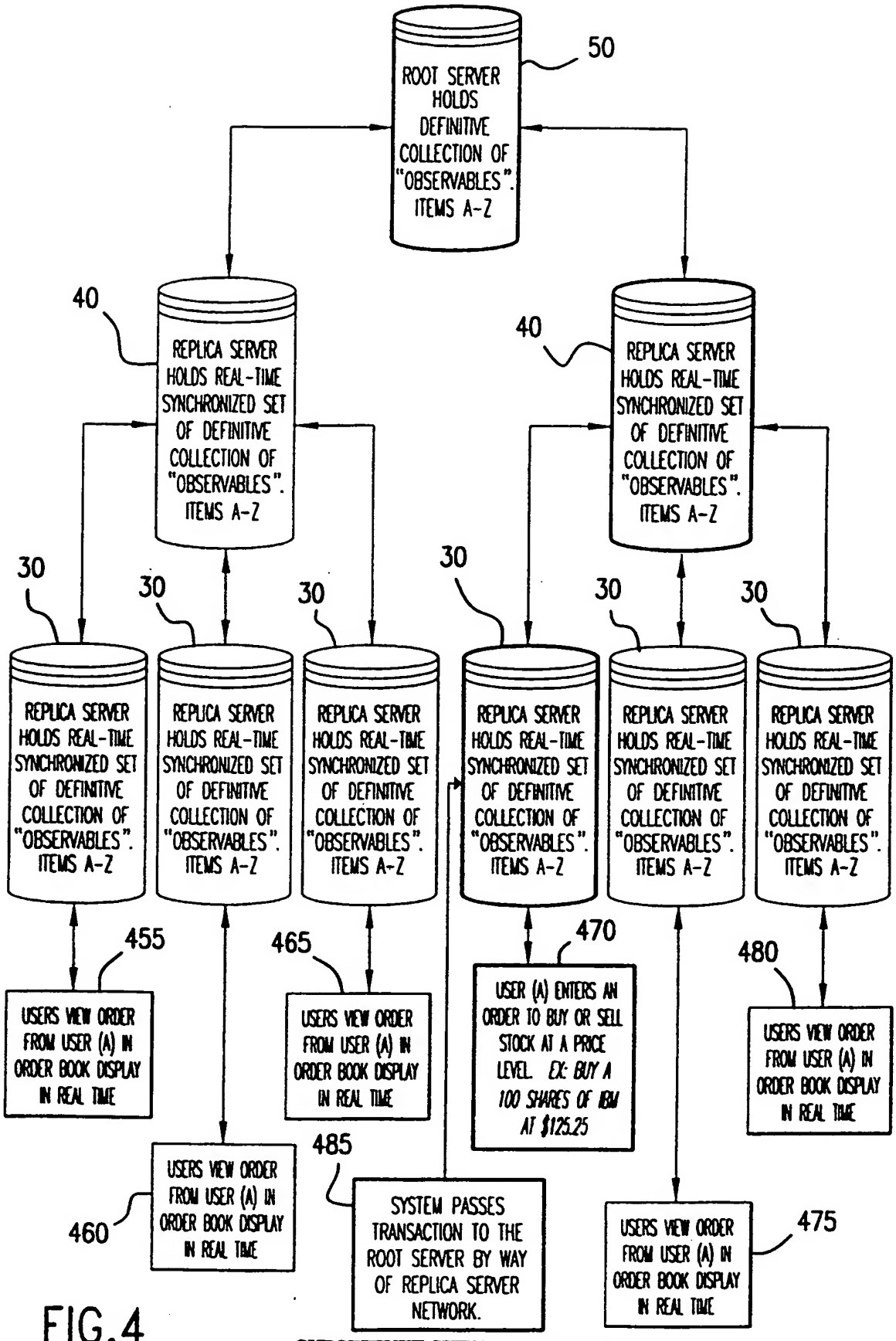

ROOT SERVER HOLDS DEFINITIVE COLLECTION OF "OBSERVABLES". ITEMS A-Z
50
REPLICA SERVER HOLDS REAL-TIME SYNCHRONIZED SET OF DEFINITIVE COLLECTION OF "OBSERVABLES". ITEMS A-Z
40
40
30
30
30
30
30
30
455
465
470
480
460
485
475
USERS VIEW ORDER FROM USER (A) IN ORDER BOOK DISPLAY IN REAL TIME
USER (A) ENTERS AN ORDER TO BUY OR SELL STOCK AT A PRICE LEVEL. EX: BUY A 100 SHARES OF IBM AT $125.25
SYSTEM PASSES TRANSACTION TO THE ROOT SERVER BY WAY OF REPLICA SERVER NETWORK.

FIG.4

WEST

VISUAL QUOTE AND ORDER BOOK DISPLAY — AFTER HOURS MKT. IS OPEN — $ — HELP — PREF.

IBM INTERNATIONAL BUSINESS MACHINES

BUY SIDE			PRICE IN 1/16		SELL SIDE	
YOUR ORDERS	AON QTY.	LIMIT QTY.	DECIMALS	LIMIT QTY.	AON QTY.	YOUR ORDERS
			145	100	500	
			144.9375	500	1000	300
			144.876	400	500	
500			144.8125	400	500	200
			144.75	150	1000	
			144.6875	1000	1000	100
			144.625	4500	2500	
			144.562	5000	3000	
			144.5	2000	10000	
			144.4375			
			144.375			
			144.3125			
		9500	144.25			
	3000	3000	144.1875			
	2500	1000	144.125			
	1000	100	144.0625			
	1000	200	144			

148 | DAY | NITE
147
146
145
144
143

YOUR POS. $ 142.50

VOL	HI	LOW	LAST NITE	CHNG.NITE	LAST DAY	CHNG.DAY	P&L $4,508
980.000	$144.50	$143.00	144.5	2.25%	$143.00	1.50%	OVERALL P&L 19%
ORDER BK.	CHART	MOST ACTIVE	SHOW NEWS	NEWS OUT	DAY MKT	NITE MKT	PRICE MAP SCALE
TO SHOW NEW STOCK ENTER SYMBOL>>			SYMBOL	MOVEMENT UP	COMPRESS SPREAD		

TRADE TICKET 510 — PREF. — HELP — X

ACTION: BUY ▽ | QUANTITY: ▽ | SYMBOL: ▽ | PRICE TYPE: LIMIT ▽

LIMIT PRICE: 52 ▽ | STOP PRICE: ▽ | ACCT. 93901031 | ☐ NEGOTIATIONS ALLOWED ☐ ANONYMOUS

DURATION: DAY ▽ | CONDITION: NONE ▽ | ACCOUNT: CASH ▽ | ROUTE TO: NONE ▽

REAL-TIME QUOTE SHOWN BELOW

OPEN	HI	LAST	CHANGE
CLOSE	LOW	VOL	
BID:0.0	BID SIZE: 0.0	ASK: 0.0	ASK SIZE: 0.0

YOUR CURRENT BUYING POWER IS: $
IF YOU EXECUTE THIS TRADE YOUR BALANCE WILL BE $
THE TOTAL COST INCLUDING COMMISSION WILL BE $

VERIFICATION	SHOW DSM	CANCEL
	CLEAR	HIDE DETAILS

WIT CAPITAL

ON LINE	WELCOME TO THE NEW WIT CAPITAL DIGITAL STOCK MARKET		
	IBM +.9375, 144.5		
WIT			
WATCH STKS.			
YOUR STKS.			

TRADE STOCKS	POS./P&L	ACCOUNT HISTORY	FINANCIAL SUMMARY
QUICK QUOTE	OPEN ORDERS	NEGOTIATIONS	MESSAGES

520

530

FIG.5A

SUBSTITUTE SHEET (RULE 26)

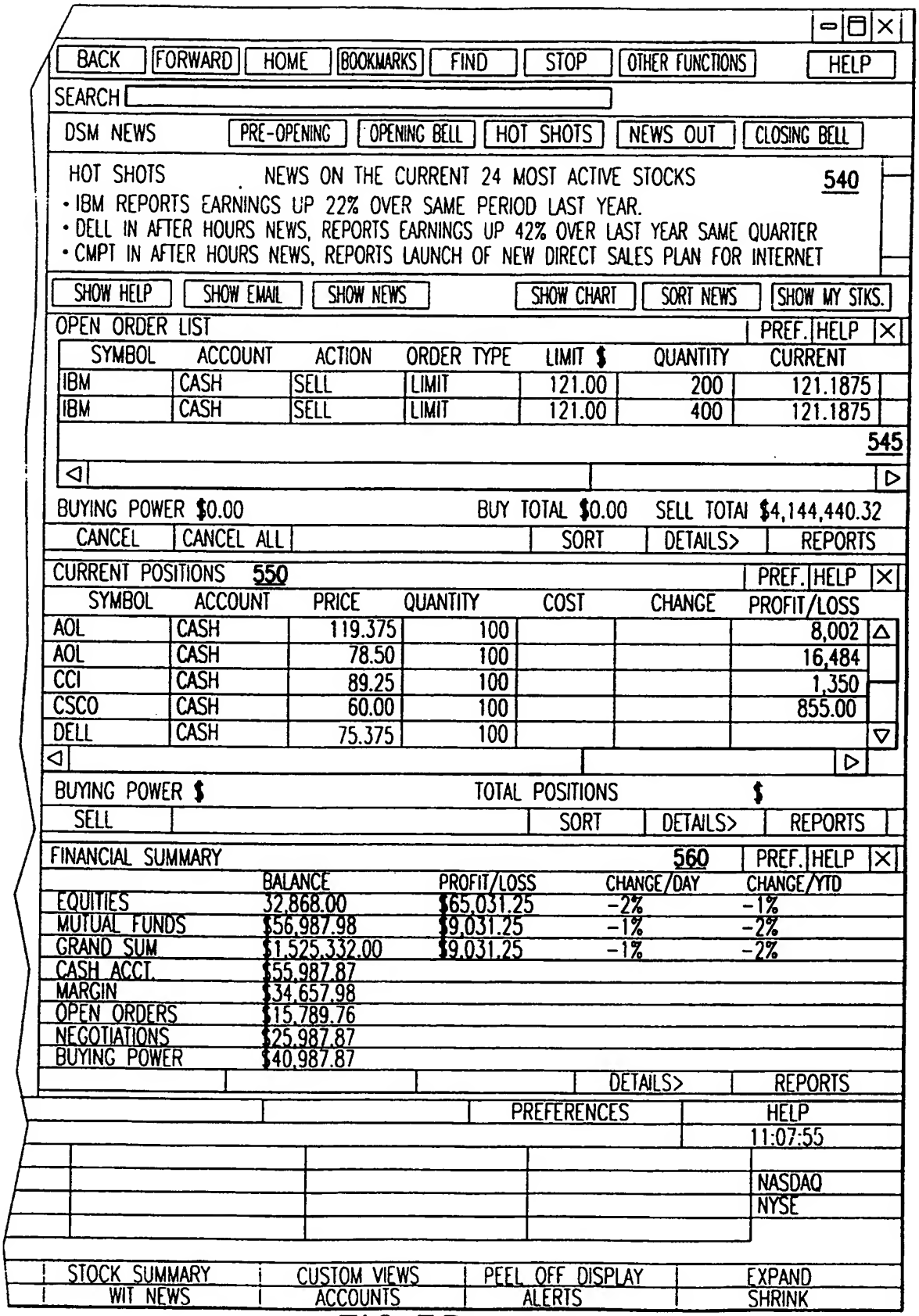


FIG.5B

SUBSTITUTE SHEET (RULE 26)

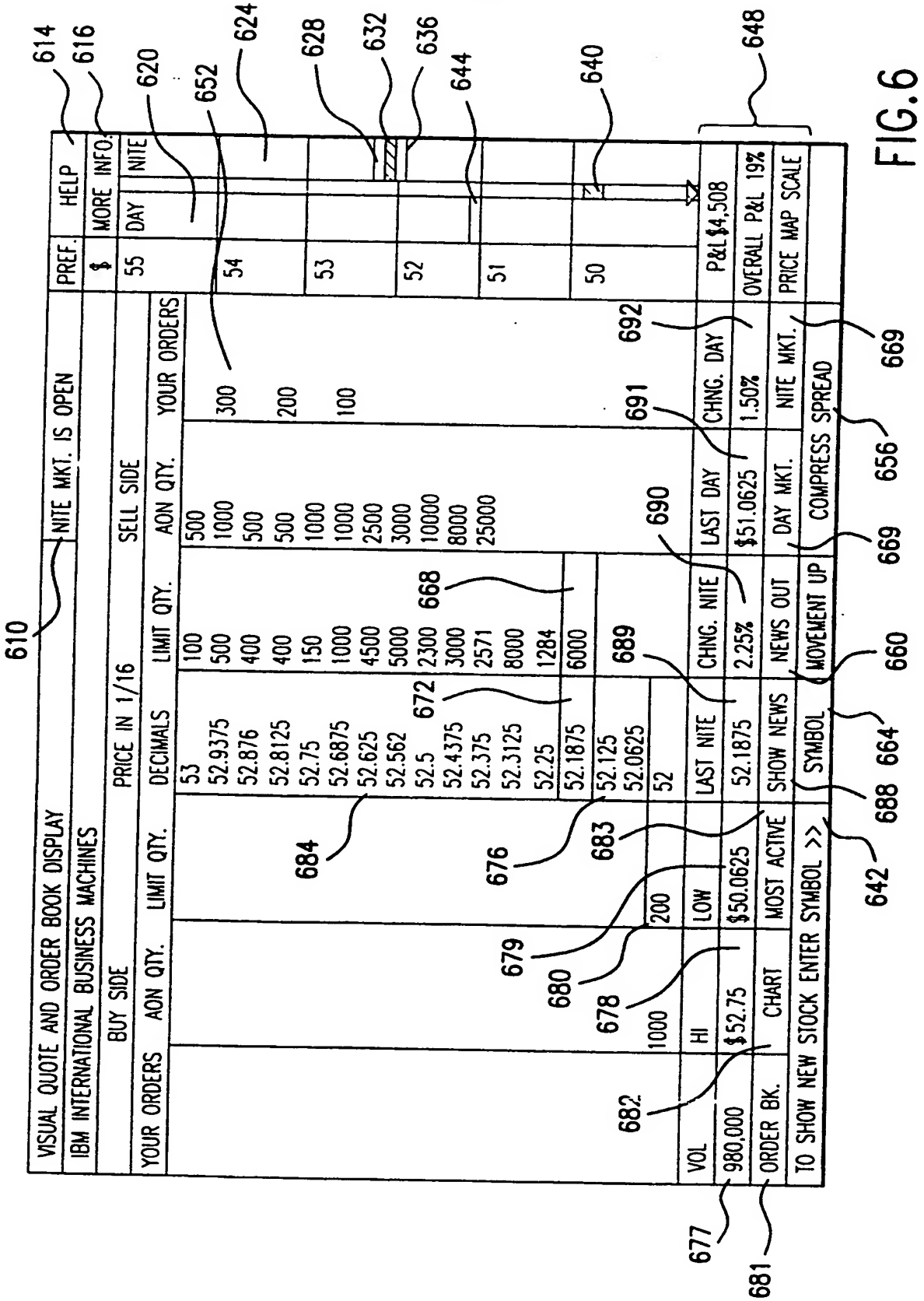

VISUAL QUOTE AND ORDER BOOK DISPLAY
NITE MKT. IS OPEN
PREF.
HELP
IBM INTERNATIONAL BUSINESS MACHINES
$
MORE INFO.
BUY SIDE
PRICE IN 1/16
SELL SIDE
55
DAY
NITE
YOUR ORDERS
AON QTY.
LIMIT QTY.
DECIMALS
LIMIT QTY.
AON QTY.
YOUR ORDERS
53
52.9375
52.876
52.8125
52.75
52.6875
52.625
52.562
52.5
52.4375
52.375
52.3125
52.25
52.1875
52.125
52.0625
52
54
53
52
51
50
300
200
100
100
500
1000
500
500
1000
1000
2500
3000
10000
8000
25000
100
500
400
400
150
1000
4500
5000
2300
3000
2571
8000
1284
6000
1000
200
CHNG. NITE
LAST NITE
LOW
HI
MOST ACTIVE
CHART
ORDER BK.
VOL
980,000
$52.75
$50.0625
52.1875
2.25%
SHOW NEWS
NEWS OUT
SYMBOL
MOVEMENT UP
LAST DAY
$51.0625
DAY MKT.
COMPRESS SPREAD
CHNG. DAY
1.50%
NITE MKT.
P&L $4,508
OVERALL P&L 19%
PRICE MAP SCALE
TO SHOW NEW STOCK ENTER SYMBOL >>
610
614
616
620
652
624
628
632
636
644
640
648
692
691
690
689
688
664
660
656
669
668
672
684
676
683
679
680
678
682
677
681
642

FIG.6

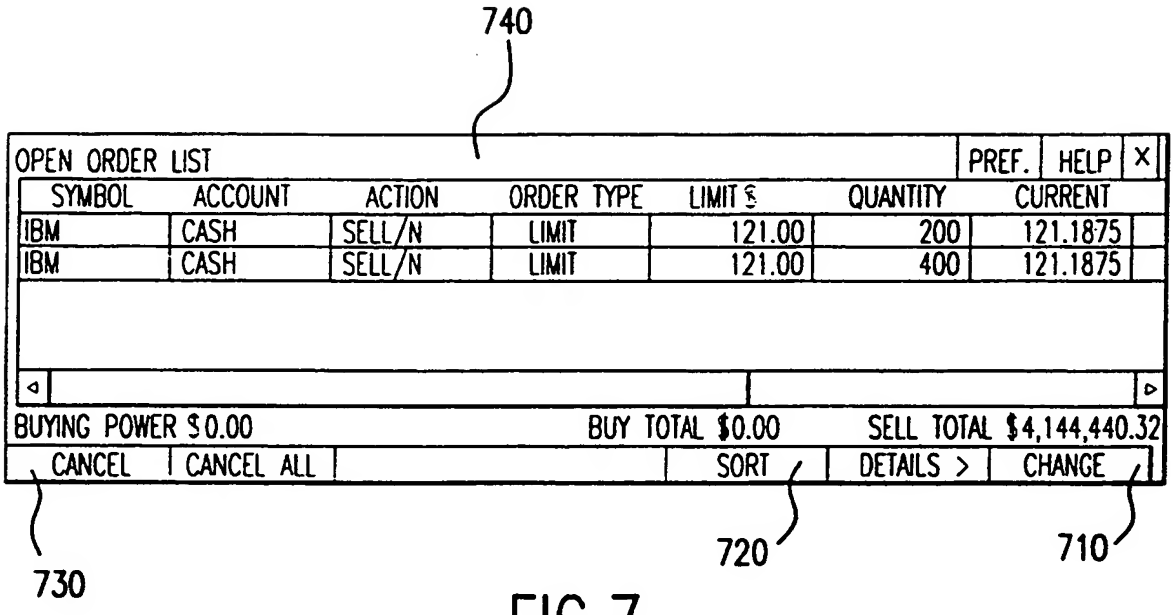

740
OPEN ORDER LIST
PREF.
HELP
X
SYMBOL
ACCOUNT
ACTION
ORDER TYPE
LIMIT $
QUANTITY
CURRENT
IBM
CASH
SELL/N
LIMIT
121.00
200
121.1875
IBM
CASH
SELL/N
LIMIT
121.00
400
121.1875
BUYING POWER $0.00
BUY TOTAL $0.00
SELL TOTAL $4,144,440.32
CANCEL
CANCEL ALL
SORT
DETAILS >
CHANGE
730
720
710

FIG.7

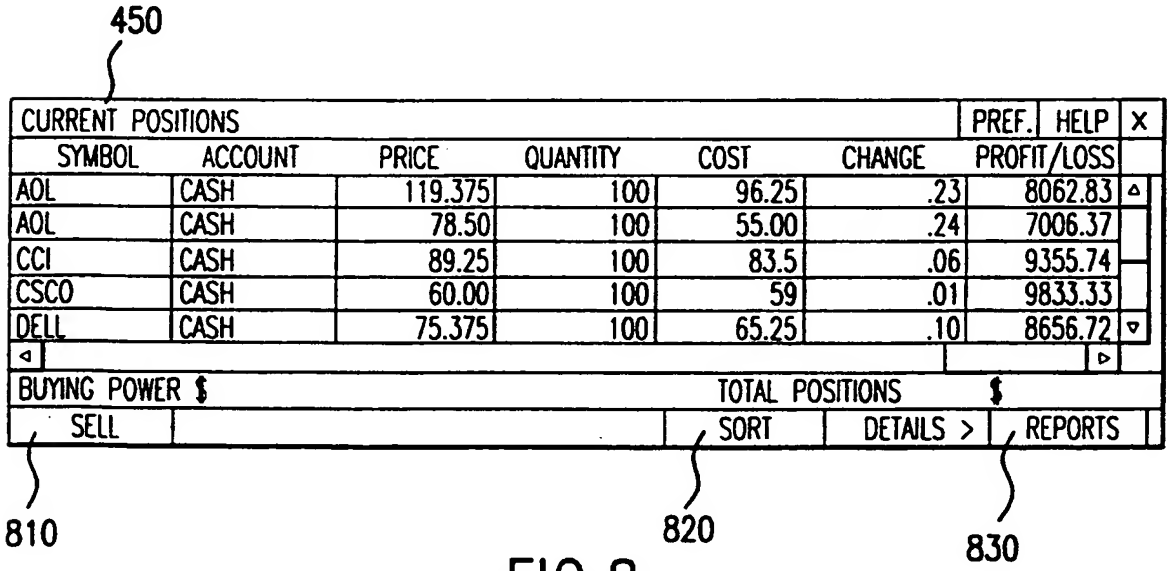

450
CURRENT POSITIONS
PREF.
HELP
X
SYMBOL
ACCOUNT
PRICE
QUANTITY
COST
CHANGE
PROFIT/LOSS
AOL
CASH
119.375
100
96.25
.23
8062.83
AOL
CASH
78.50
100
55.00
.24
7006.37
CCI
CASH
89.25
100
83.5
.06
9355.74
CSCO
CASH
60.00
100
59
.01
9833.33
DELL
CASH
75.375
100
65.25
.10
8656.72
BUYING POWER $
TOTAL POSITIONS $
SELL
SORT
DETAILS >
REPORTS
810
820
830

FIG.8

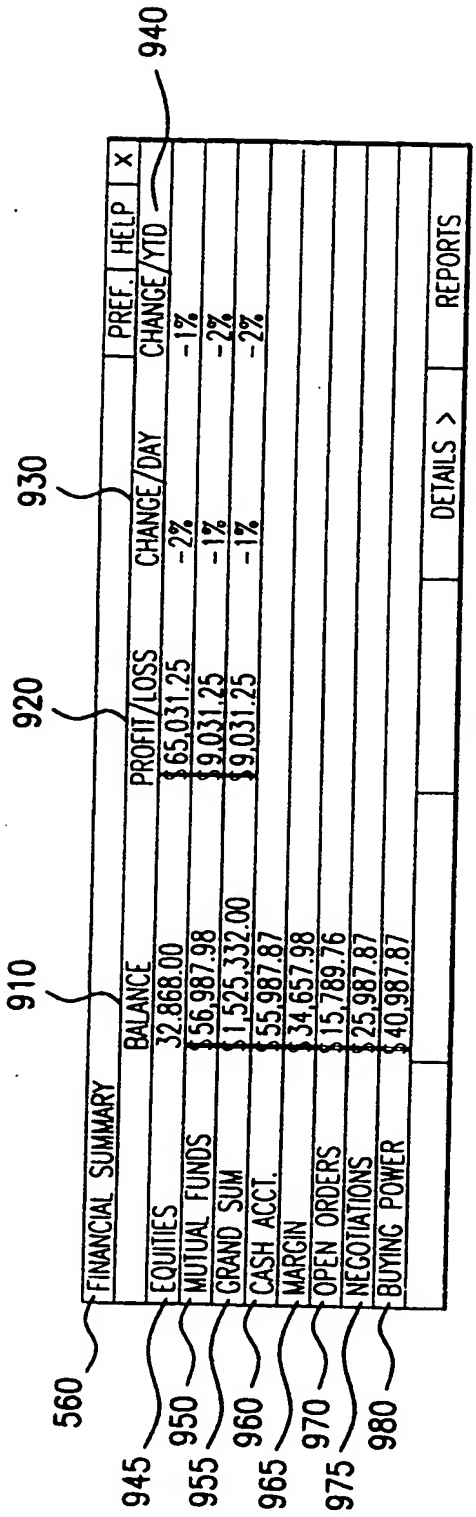

FINANCIAL SUMMARY
PREF.
HELP
X
BALANCE
PROFIT/LOSS
CHANGE/DAY
CHANGE/YTD
EQUITIES
32,868.00
$65,031.25
-2%
-1%
MUTUAL FUNDS
$56,987.98
$9,031.25
-1%
-2%
GRAND SUM
$1,525,332.00
$9,031.25
-1%
-2%
CASH ACCT.
$55,987.87
MARGIN
$34,657.98
OPEN ORDERS
$15,789.76
NEGOTIATIONS
$25,987.87
BUYING POWER
$40,987.87
DETAILS >
REPORTS
910
920
930
940
560
945
950
955
960
965
970
975
980

FIG.9

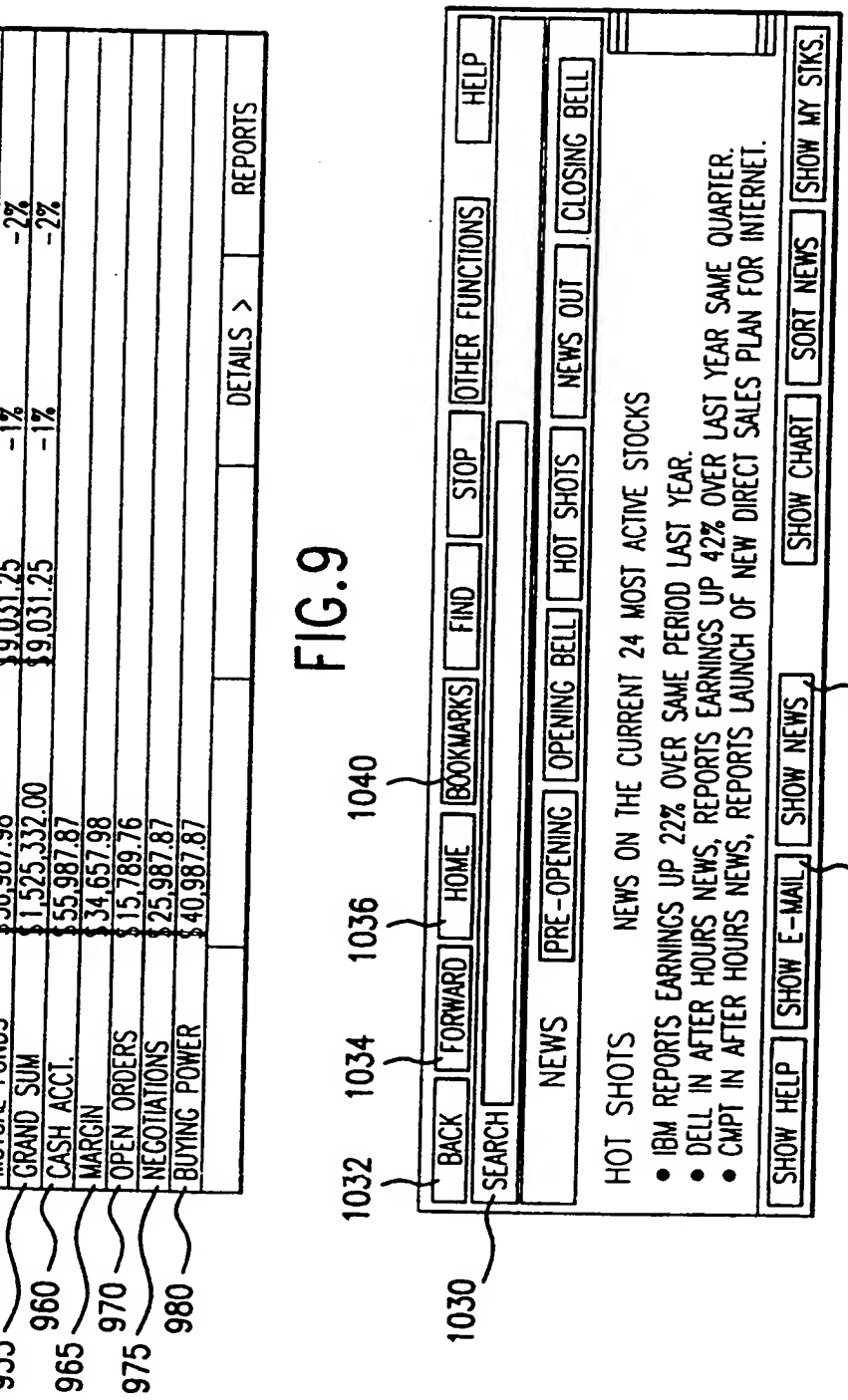

BACK
FORWARD
HOME
BOOKMARKS
FIND
STOP
OTHER FUNCTIONS
HELP
SEARCH
NEWS
PRE-OPENING
OPENING BELL
HOT SHOTS
NEWS OUT
CLOSING BELL
HOT SHOTS
NEWS ON THE CURRENT 24 MOST ACTIVE STOCKS
• IBM REPORTS EARNINGS UP 22% OVER SAME PERIOD LAST YEAR.
• DELL IN AFTER HOURS NEWS, REPORTS EARNINGS UP 42% OVER LAST YEAR SAME QUARTER.
• CMPT IN AFTER HOURS NEWS, REPORTS LAUNCH OF NEW DIRECT SALES PLAN FOR INTERNET.
SHOW HELP
SHOW E-MAIL
SHOW NEWS
SHOW CHART
SORT NEWS
SHOW MY STKS.
1030
1032
1034
1036
1040
1010
1020

FIG.10

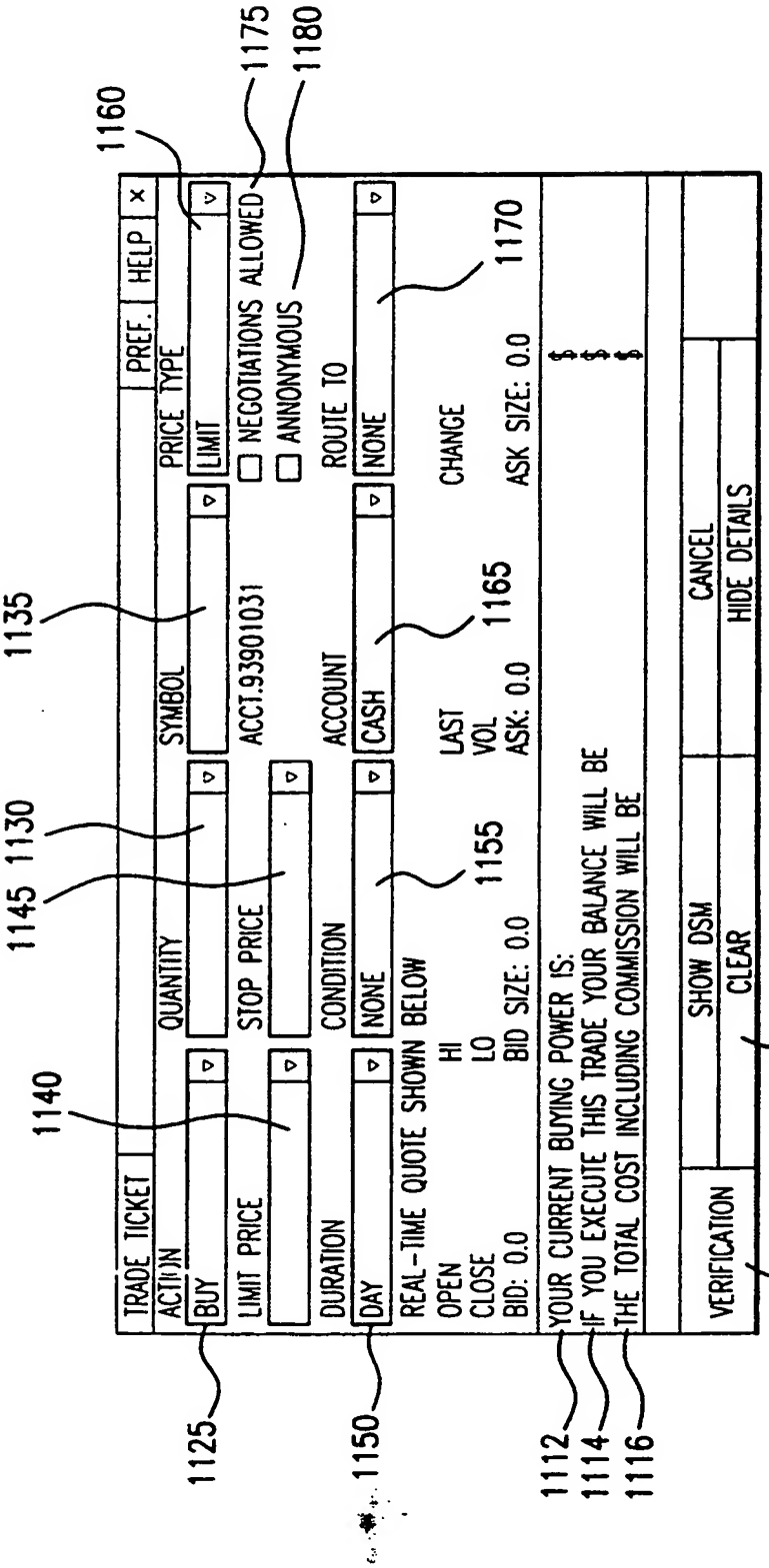

TRADE TICKET
PREF.
HELP
ACTION
BUY
QUANTITY
SYMBOL
PRICE TYPE
LIMIT
NEGOTIATIONS ALLOWED
ANNONYMOUS
LIMIT PRICE
STOP PRICE
ACCT.93901031
ROUTE TO
NONE
DURATION
DAY
CONDITION
NONE
ACCOUNT
CASH
CHANGE
REAL-TIME QUOTE SHOWN BELOW
OPEN
CLOSE
BID: 0.0
HI
LO
BID SIZE: 0.0
LAST
VOL
ASK: 0.0
ASK SIZE: 0.0
YOUR CURRENT BUYING POWER IS:
IF YOU EXECUTE THIS TRADE YOUR BALANCE WILL BE
THE TOTAL COST INCLUDING COMMISSION WILL BE
$
$
$
SHOW DSM
CANCEL
VERIFICATION
CLEAR
HIDE DETAILS
1110
1112
1114
1115
1116
1125
1130
1135
1140
1145
1150
1155
1160
1165
1170
1175
1180

FIG.11

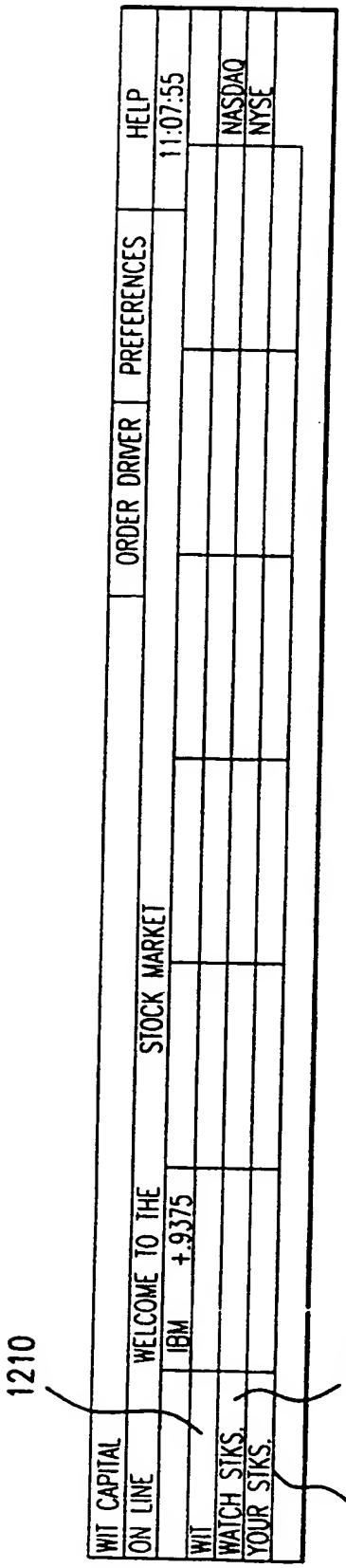

WIT CAPITAL
ON LINE
WELCOME TO THE STOCK MARKET
ORDER DRIVER
PREFERENCES
HELP
11:07:55
NASDAQ
NYSE
IBM +.9375
WIT
WATCH STKS.
YOUR STKS.
1210
1220
1230

FIG.12

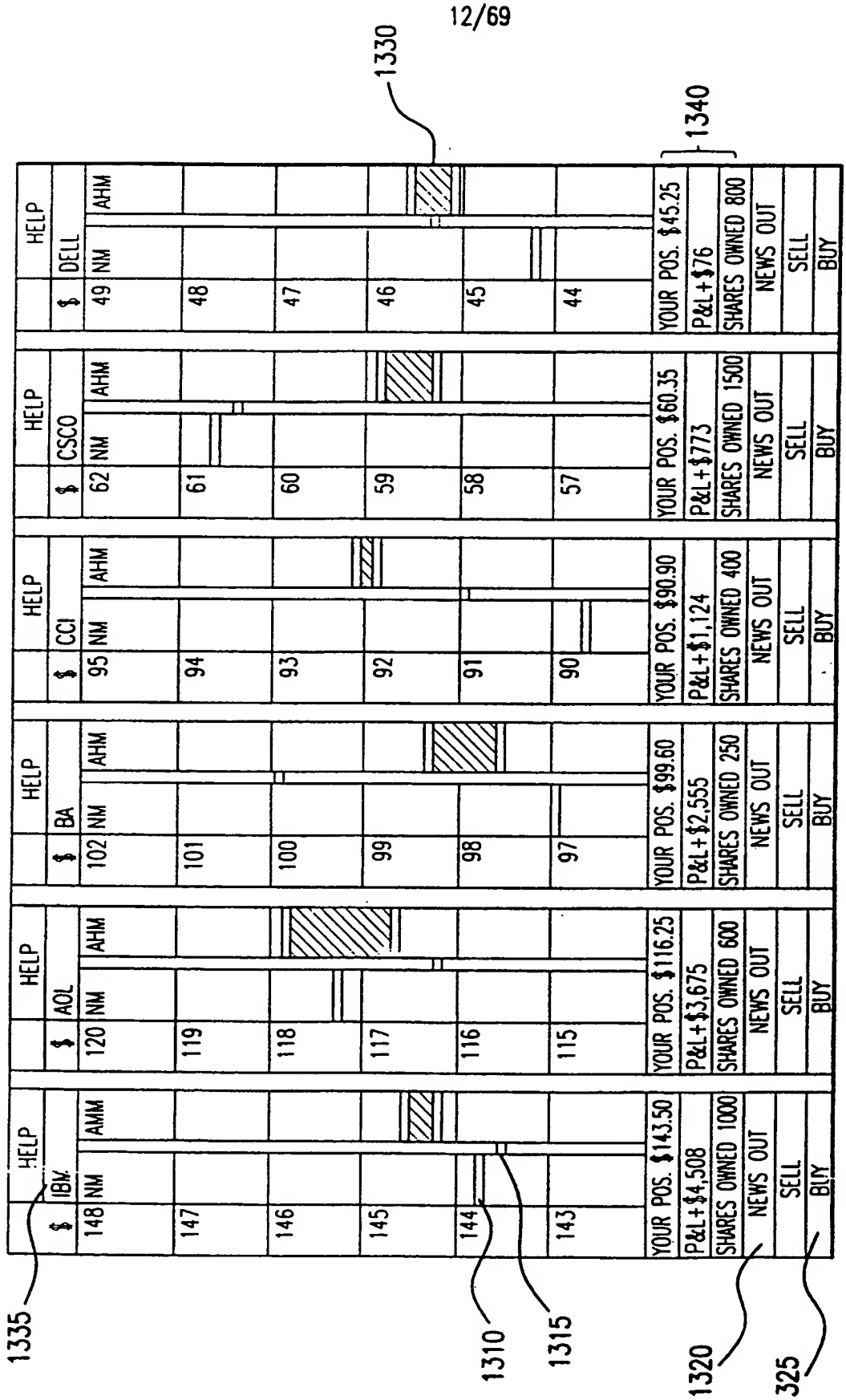

1330
1340
HELP
$ IBM NM AMM
148 147 146 145 144 143
YOUR POS. $143.50
P&L+$4,508
SHARES OWNED 1000
NEWS OUT
SELL
BUY
HELP
$ AOL NM AHM
120 119 118 117 116 115
YOUR POS. $116.25
P&L+$3,675
SHARES OWNED 600
NEWS OUT
SELL
BUY
HELP
$ BA NM AHM
102 101 100 99 98 97
YOUR POS. $99.60
P&L+$2,555
SHARES OWNED 250
NEWS OUT
SELL
BUY
HELP
$ CCI NM AHM
95 94 93 92 91 90
YOUR POS. $90.90
P&L+$1,124
SHARES OWNED 400
NEWS OUT
SELL
BUY
HELP
$ CSCO NM AHM
62 61 60 59 58 57
YOUR POS. $60.35
P&L+$773
SHARES OWNED 1500
NEWS OUT
SELL
BUY
HELP
$ DELL NM AHM
49 48 47 46 45 44
YOUR POS. $45.25
P&L+$76
SHARES OWNED 800
NEWS OUT
SELL
BUY
1335
1310
1315
1320
325

FIG.13

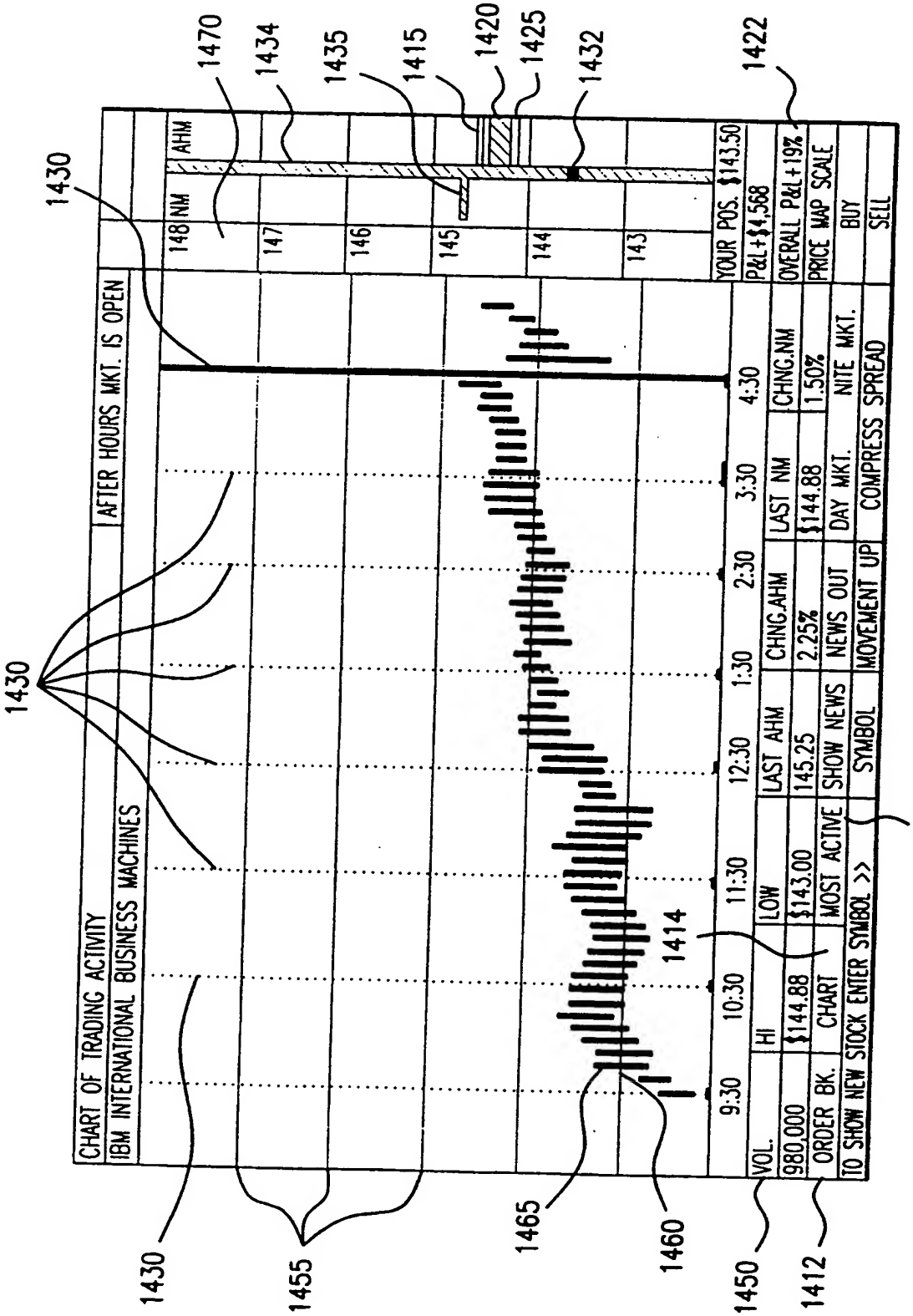

1430
1470
1434
1435
1415
1420
1425
1432
1422
AHM
148 NM
147
146
145
144
143
YOUR POS. $143.50
P&L+$4,568
OVERALL P&L+19%
PRICE MAP SCALE
BUY
SELL
AFTER HOURS MKT. IS OPEN
CHART OF TRADING ACTIVITY
IBM INTERNATIONAL BUSINESS MACHINES
9:30 10:30 11:30 12:30 1:30 2:30 3:30 4:30
CHNG.NM
LAST NM
1.50%
$144.88
DAY MKT.
NITE MKT.
CHNG.AHM
LAST AHM
2.25%
145.25
NEWS OUT
COMPRESS SPREAD
MOVEMENT UP
SYMBOL
VOL.
HI
LOW
980,000
$144.88
$143.00
ORDER BK.
CHART
MOST ACTIVE
SHOW NEWS
TO SHOW NEW STOCK ENTER SYMBOL >>
1430
1414
1416
1430
1455
1465
1460
1450
1412

FIG.14

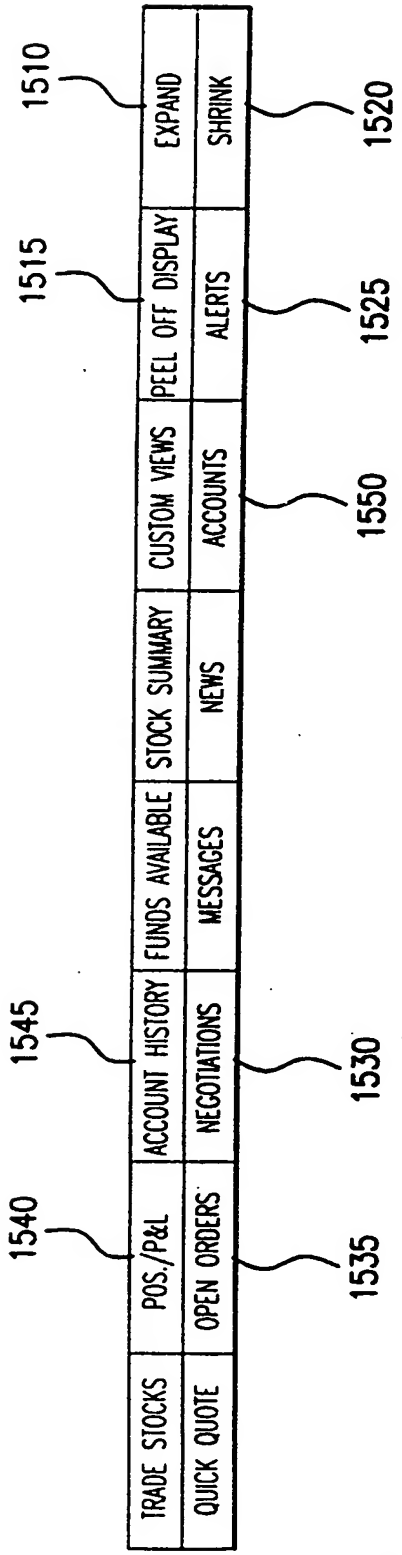

1510
1515
1520
1525
1550
1545
1530
1540
1535
EXPAND
SHRINK
PEEL OFF DISPLAY
ALERTS
CUSTOM VIEWS
ACCOUNTS
STOCK SUMMARY
NEWS
FUNDS AVAILABLE
MESSAGES
ACCOUNT HISTORY
NEGOTIATIONS
POS./P&L
OPEN ORDERS
TRADE STOCKS
QUICK QUOTE

FIG.15

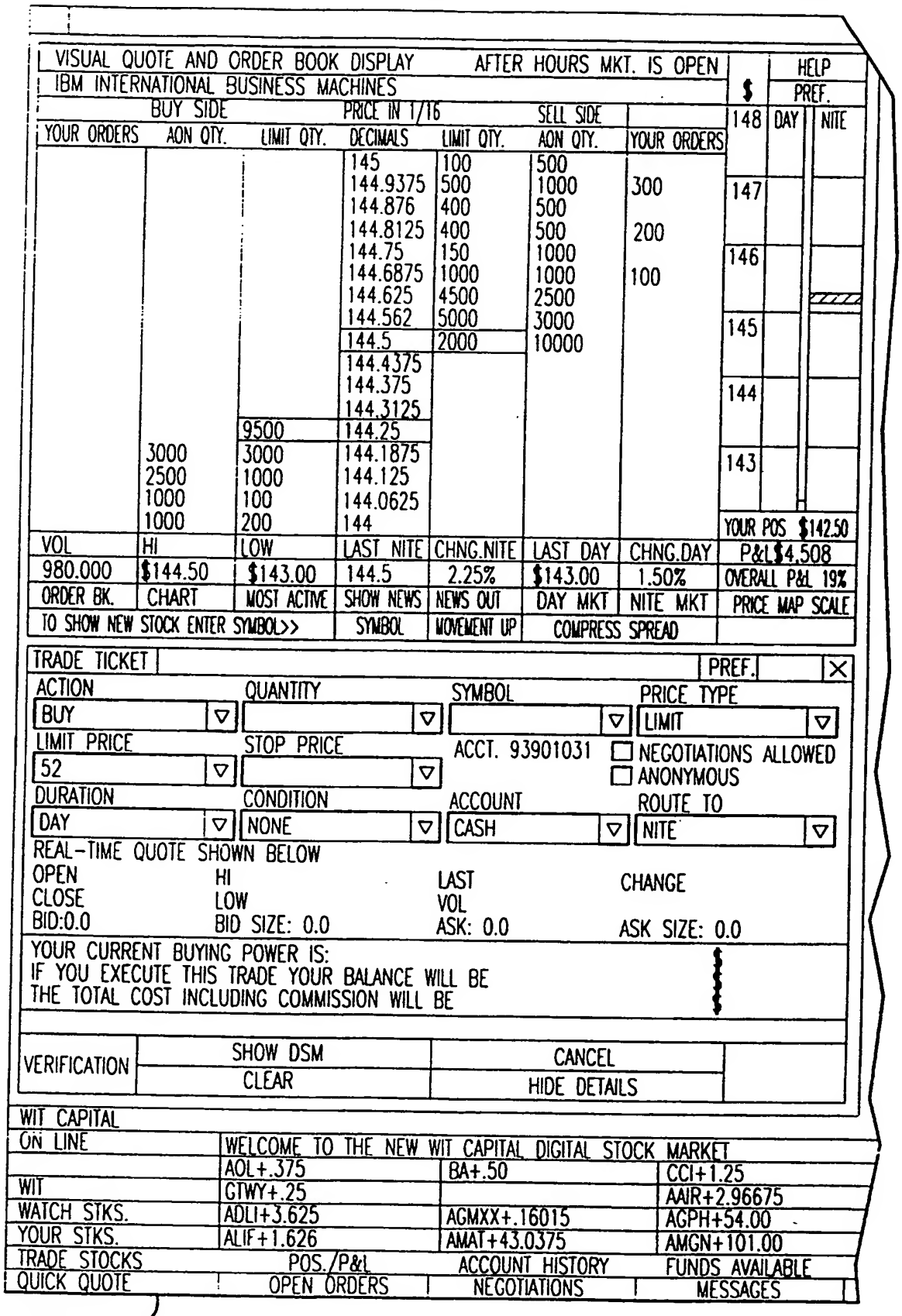

VISUAL QUOTE AND ORDER BOOK DISPLAY
AFTER HOURS MKT. IS OPEN
HELP
IBM INTERNATIONAL BUSINESS MACHINES
$
PREF.
BUY SIDE
PRICE IN 1/16
SELL SIDE
148
DAY
NITE
YOUR ORDERS
AON QTY.
LIMIT QTY.
DECIMALS
LIMIT QTY.
AON QTY.
YOUR ORDERS
145
100
500
144.9375
500
1000
300
147
144.876
400
500
144.8125
400
500
200
144.75
150
1000
146
144.6875
1000
1000
100
144.625
4500
2500
144.562
5000
3000
145
144.5
2000
10000
144.4375
144.375
144
144.3125
9500
144.25
3000
144.1875
143
2500
1000
144.125
1000
100
144.0625
1000
200
144
YOUR POS $142.50
VOL
HI
LOW
LAST NITE
CHNG.NITE
LAST DAY
CHNG.DAY
P&L $4,508
980.000
$144.50
$143.00
144.5
2.25%
$143.00
1.50%
OVERALL P&L 19%
ORDER BK.
CHART
MOST ACTIVE
SHOW NEWS
NEWS OUT
DAY MKT
NITE MKT
PRICE MAP SCALE
TO SHOW NEW STOCK ENTER SYMBOL>>
SYMBOL
MOVEMENT UP
COMPRESS SPREAD
TRADE TICKET
PREF.
ACTION
QUANTITY
SYMBOL
PRICE TYPE
BUY
LIMIT
LIMIT PRICE
STOP PRICE
ACCT. 93901031
NEGOTIATIONS ALLOWED
ANONYMOUS
52
DURATION
CONDITION
ACCOUNT
ROUTE TO
DAY
NONE
CASH
NITE
REAL-TIME QUOTE SHOWN BELOW
OPEN
HI
LAST
CHANGE
CLOSE
LOW
VOL
BID:0.0
BID SIZE: 0.0
ASK: 0.0
ASK SIZE: 0.0
YOUR CURRENT BUYING POWER IS:
IF YOU EXECUTE THIS TRADE YOUR BALANCE WILL BE
THE TOTAL COST INCLUDING COMMISSION WILL BE
VERIFICATION
SHOW DSM
CANCEL
CLEAR
HIDE DETAILS
WIT CAPITAL
ON LINE
WELCOME TO THE NEW WIT CAPITAL DIGITAL STOCK MARKET
AOL+.375
BA+.50
CCI+1.25
WIT
GTWY+.25
AAIR+2.96675
WATCH STKS.
ADLI+3.625
AGMXX+.16015
AGPH+54.00
YOUR STKS.
ALIF+1.626
AMAT+43.0375
AMGN+101.00
TRADE STOCKS
POS./P&L
ACCOUNT HISTORY
FUNDS AVAILABLE
QUICK QUOTE
OPEN ORDERS
NEGOTIATIONS
MESSAGES
1610

FIG.16A

WEST

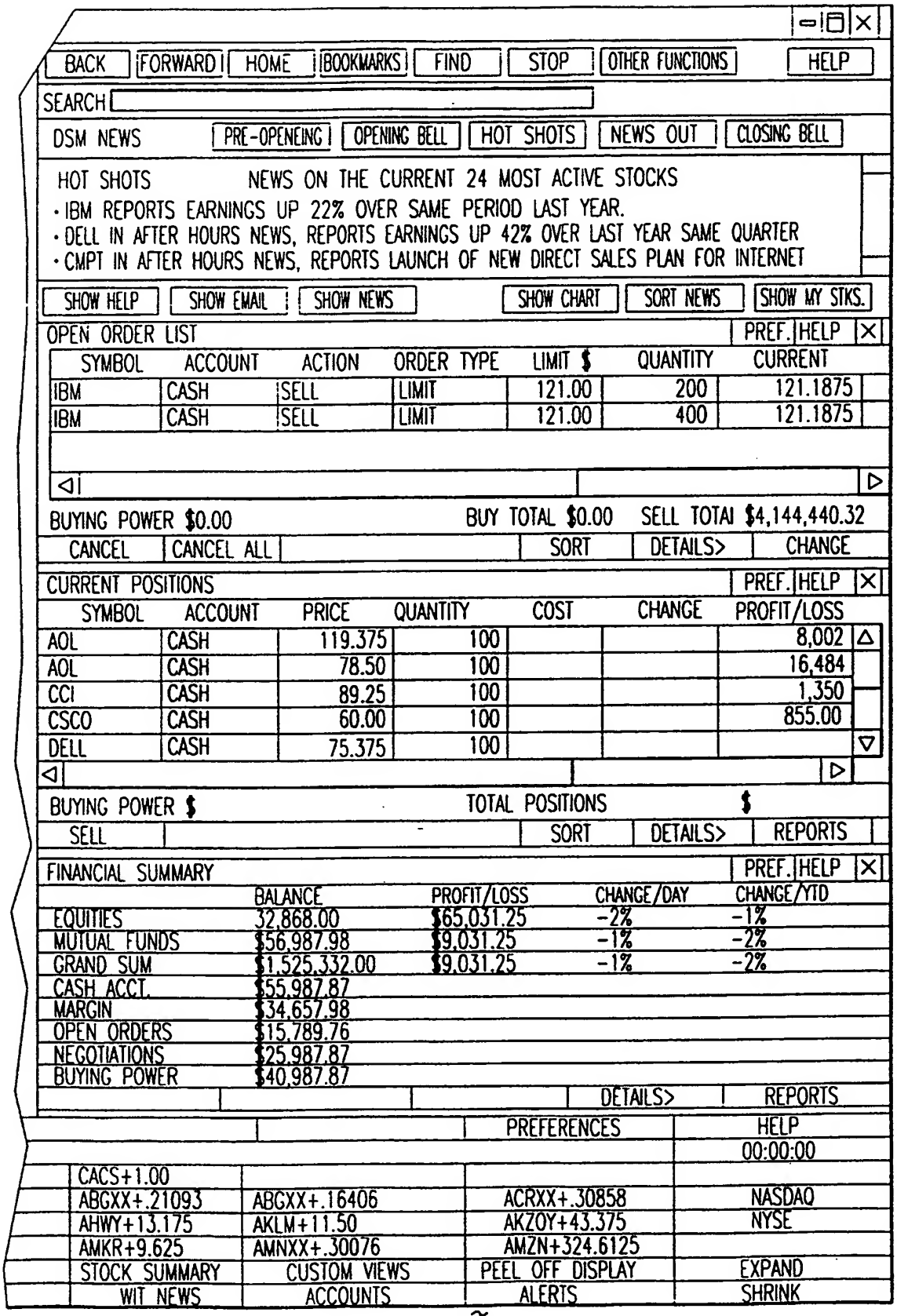


FIG.16B

CONTINUED ON FIG.16C

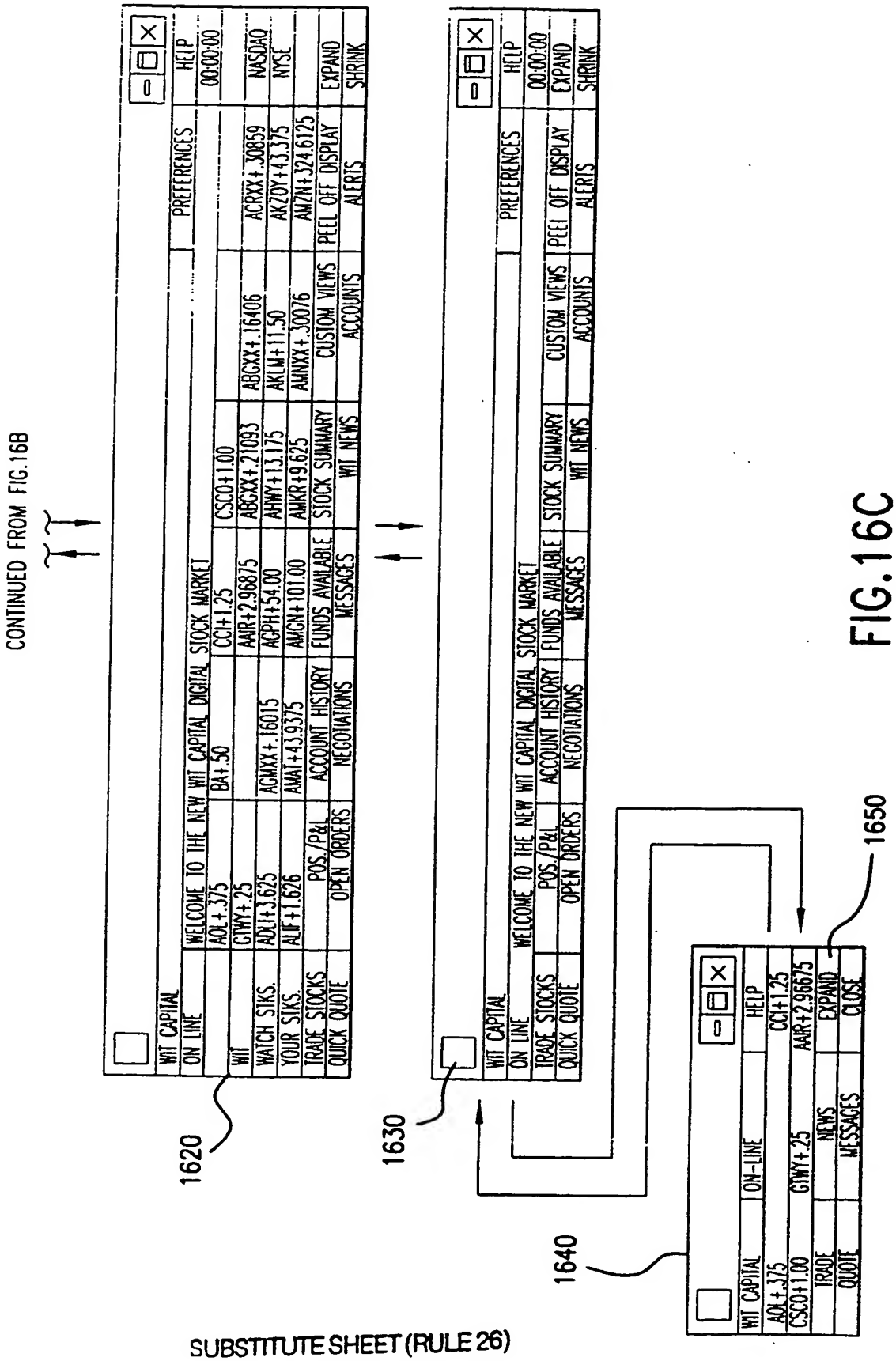

CONTINUED FROM FIG.16B
WIT CAPITAL
ON LINE
WELCOME TO THE NEW WIT CAPITAL DIGITAL STOCK MARKET
PREFERENCES
HELP
AOL+.375
BA+.50
CCI+1.25
CSCO+1.00
00:00:00
WIT
GTWY+.25
AAIR+2.96875
ABCXX+.21093
ABCXX+.16406
ACRXX+.30859
NASDAQ
WATCH STKS.
ADLI+3.625
ACMXX+.16015
ACPH+54.00
AHWY+13.175
AKLM+11.50
AKZOY+43.375
NYSE
YOUR STKS.
ALIF+1.626
AWAT+43.9375
AMGN+101.00
AMKR+9.625
AMNXX+.30076
AMZN+324.6125
TRADE STOCKS
POS./P&L
ACCOUNT HISTORY
FUNDS AVAILABLE
STOCK SUMMARY
CUSTOM VIEWS
PEEL OFF DISPLAY
EXPAND
QUICK QUOTE
OPEN ORDERS
NEGOTIATIONS
MESSAGES
WIT NEWS
ACCOUNTS
ALERTS
SHRINK
1620
1630
1640
1650

FIG.16C

WEST

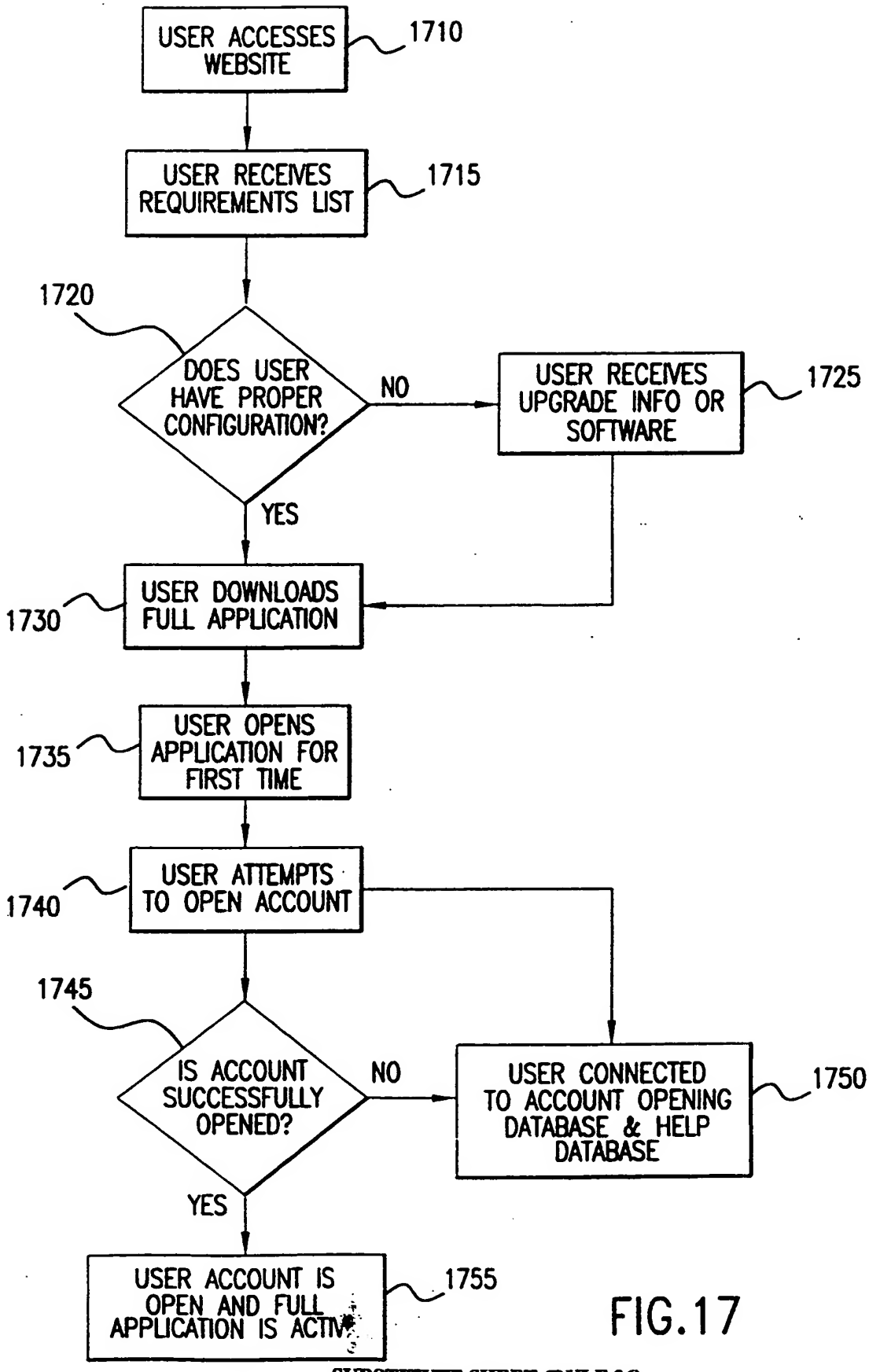

USER ACCESSES WEBSITE
1710
USER RECEIVES REQUIREMENTS LIST
1715
1720
DOES USER HAVE PROPER CONFIGURATION?
NO
USER RECEIVES UPGRADE INFO OR SOFTWARE
1725
YES
1730
USER DOWNLOADS FULL APPLICATION
1735
USER OPENS APPLICATION FOR FIRST TIME
1740
USER ATTEMPTS TO OPEN ACCOUNT
1745
IS ACCOUNT SUCCESSFULLY OPENED?
NO
USER CONNECTED TO ACCOUNT OPENING DATABASE & HELP DATABASE
1750
YES
USER ACCOUNT IS OPEN AND FULL APPLICATION IS ACTIV
1755

FIG.17

WEST

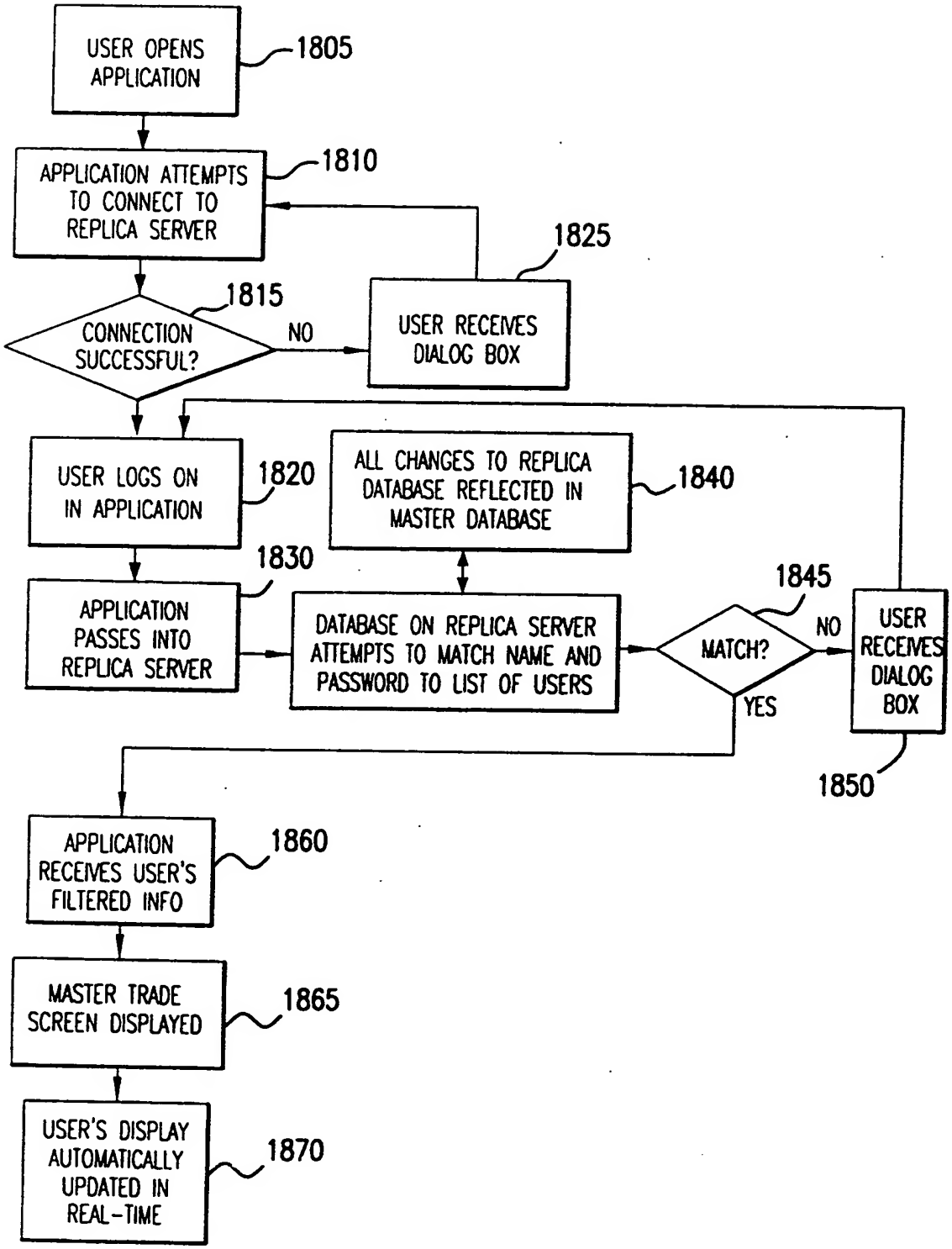

USER OPENS APPLICATION
1805
APPLICATION ATTEMPTS TO CONNECT TO REPLICA SERVER
1810
1825
1815
CONNECTION SUCCESSFUL?
NO
USER RECEIVES DIALOG BOX
USER LOGS ON IN APPLICATION
1820
ALL CHANGES TO REPLICA DATABASE REFLECTED IN MASTER DATABASE
1840
1830
APPLICATION PASSES INTO REPLICA SERVER
DATABASE ON REPLICA SERVER ATTEMPTS TO MATCH NAME AND PASSWORD TO LIST OF USERS
1845
MATCH?
NO
YES
USER RECEIVES DIALOG BOX
1850
APPLICATION RECEIVES USER'S FILTERED INFO
1860
MASTER TRADE SCREEN DISPLAYED
1865
USER'S DISPLAY AUTOMATICALLY UPDATED IN REAL-TIME
1870

FIG.18

WEST

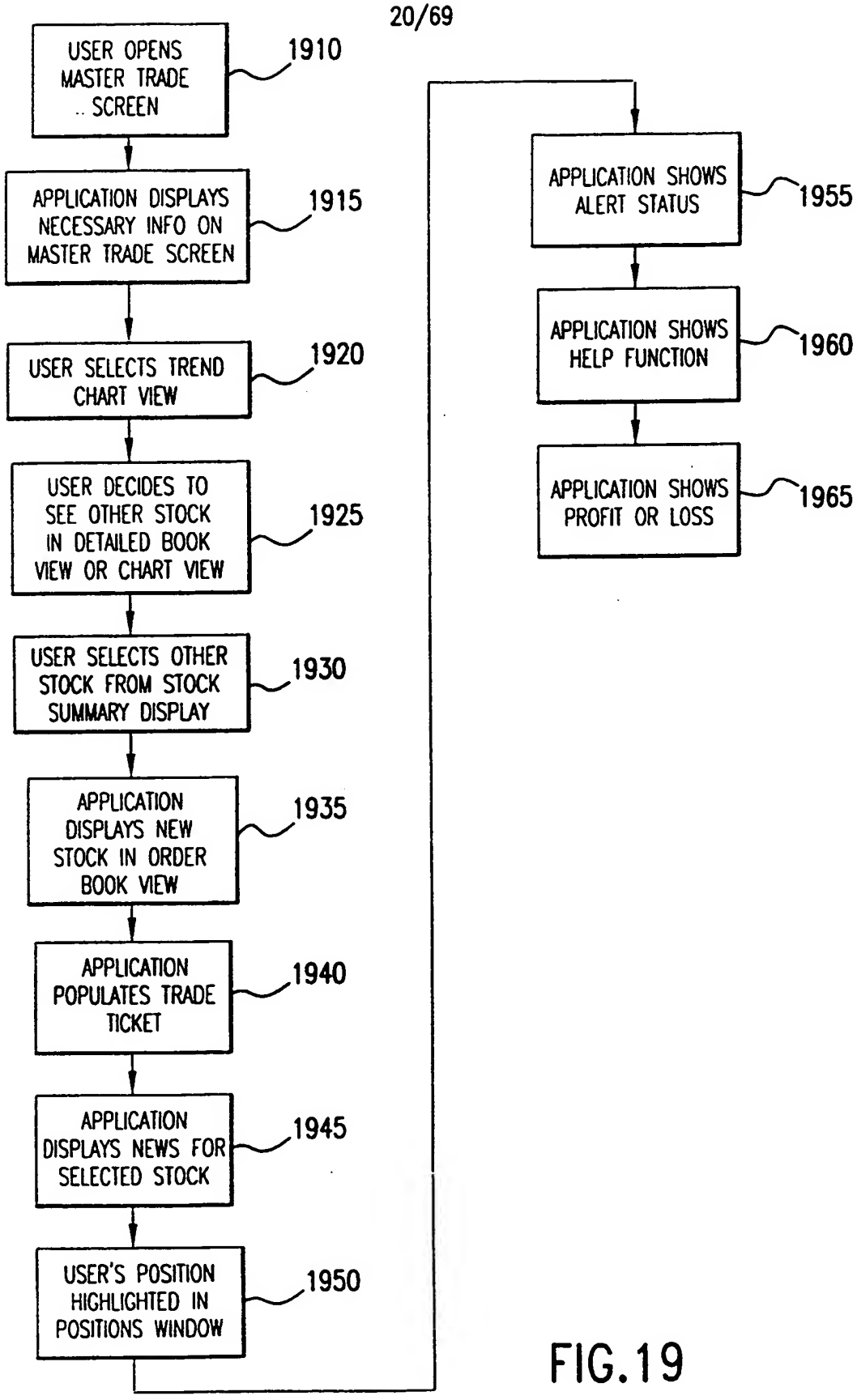

USER OPENS MASTER TRADE .. SCREEN
1910
APPLICATION DISPLAYS NECESSARY INFO ON MASTER TRADE SCREEN
1915
USER SELECTS TREND CHART VIEW
1920
USER DECIDES TO SEE OTHER STOCK IN DETAILED BOOK VIEW OR CHART VIEW
1925
USER SELECTS OTHER STOCK FROM STOCK SUMMARY DISPLAY
1930
APPLICATION DISPLAYS NEW STOCK IN ORDER BOOK VIEW
1935
APPLICATION POPULATES TRADE TICKET
1940
APPLICATION DISPLAYS NEWS FOR SELECTED STOCK
1945
USER'S POSITION HIGHLIGHTED IN POSITIONS WINDOW
1950
APPLICATION SHOWS ALERT STATUS
1955
APPLICATION SHOWS HELP FUNCTION
1960
APPLICATION SHOWS PROFIT OR LOSS
1965

FIG.19

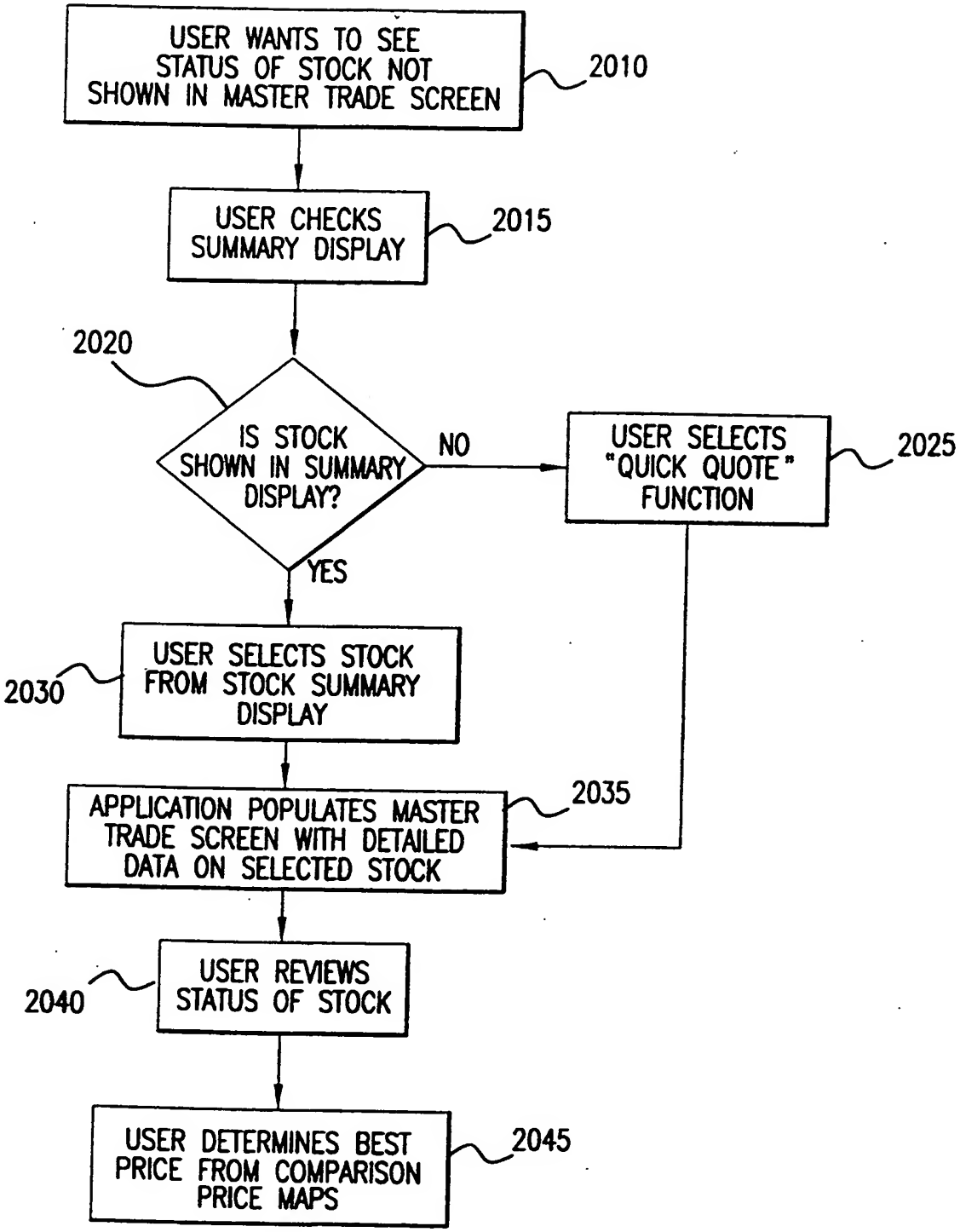

USER WANTS TO SEE STATUS OF STOCK NOT SHOWN IN MASTER TRADE SCREEN
2010
USER CHECKS SUMMARY DISPLAY
2015
2020
IS STOCK SHOWN IN SUMMARY DISPLAY?
NO
USER SELECTS "QUICK QUOTE" FUNCTION
2025
YES
USER SELECTS STOCK FROM STOCK SUMMARY DISPLAY
2030
APPLICATION POPULATES MASTER TRADE SCREEN WITH DETAILED DATA ON SELECTED STOCK
2035
USER REVIEWS STATUS OF STOCK
2040
USER DETERMINES BEST PRICE FROM COMPARISON PRICE MAPS
2045

FIG.20

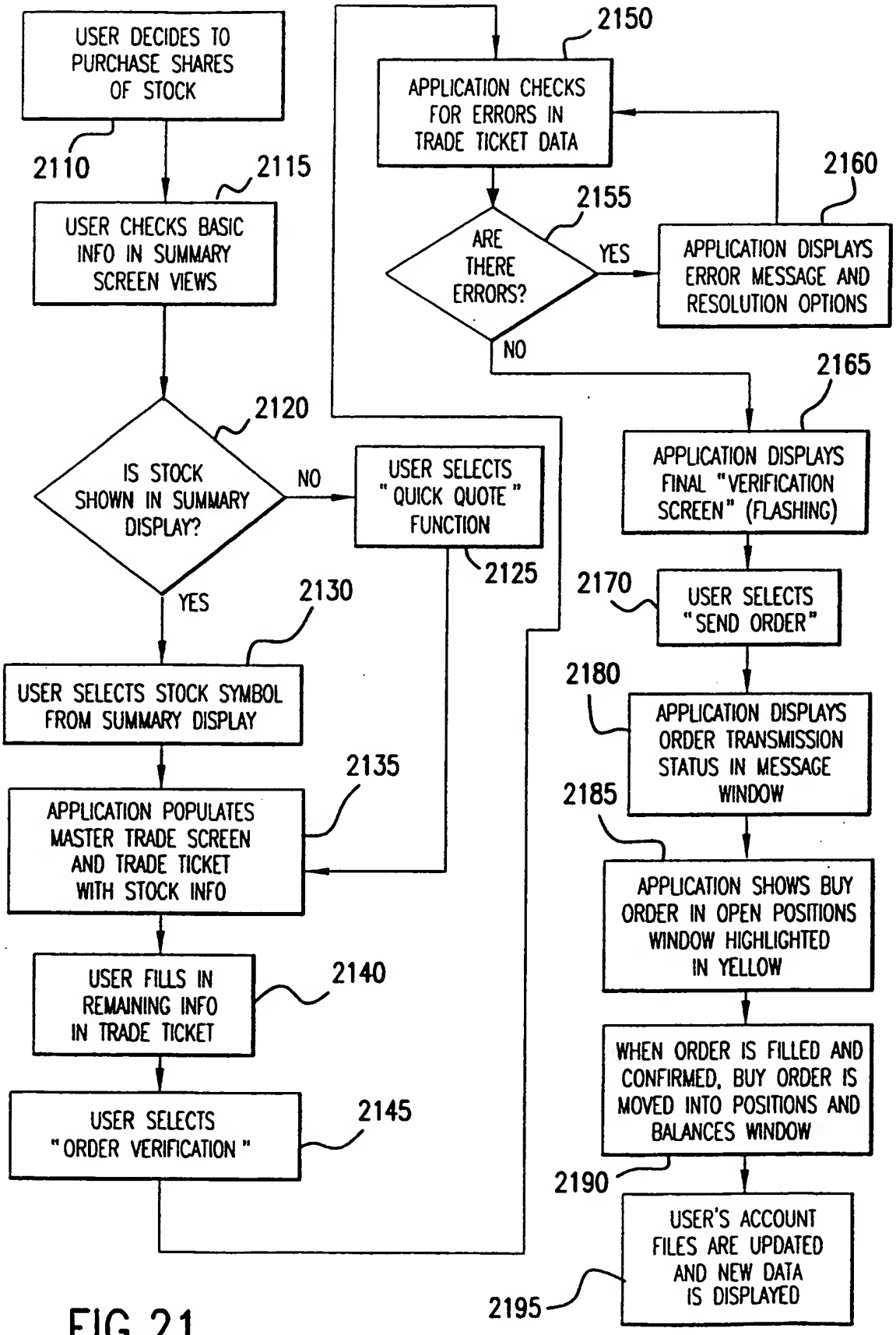

USER DECIDES TO PURCHASE SHARES OF STOCK
2110
USER CHECKS BASIC INFO IN SUMMARY SCREEN VIEWS
2115
IS STOCK SHOWN IN SUMMARY DISPLAY?
2120
NO
USER SELECTS "QUICK QUOTE" FUNCTION
2125
YES
USER SELECTS STOCK SYMBOL FROM SUMMARY DISPLAY
2130
APPLICATION POPULATES MASTER TRADE SCREEN AND TRADE TICKET WITH STOCK INFO
2135
USER FILLS IN REMAINING INFO IN TRADE TICKET
2140
USER SELECTS "ORDER VERIFICATION"
2145
APPLICATION CHECKS FOR ERRORS IN TRADE TICKET DATA
2150
ARE THERE ERRORS?
2155
YES
APPLICATION DISPLAYS ERROR MESSAGE AND RESOLUTION OPTIONS
2160
NO
APPLICATION DISPLAYS FINAL "VERIFICATION SCREEN" (FLASHING)
2165
USER SELECTS "SEND ORDER"
2170
APPLICATION DISPLAYS ORDER TRANSMISSION STATUS IN MESSAGE WINDOW
2180
APPLICATION SHOWS BUY ORDER IN OPEN POSITIONS WINDOW HIGHLIGHTED IN YELLOW
2185
WHEN ORDER IS FILLED AND CONFIRMED, BUY ORDER IS MOVED INTO POSITIONS AND BALANCES WINDOW
2190
USER'S ACCOUNT FILES ARE UPDATED AND NEW DATA IS DISPLAYED
2195

FIG.21

WEST

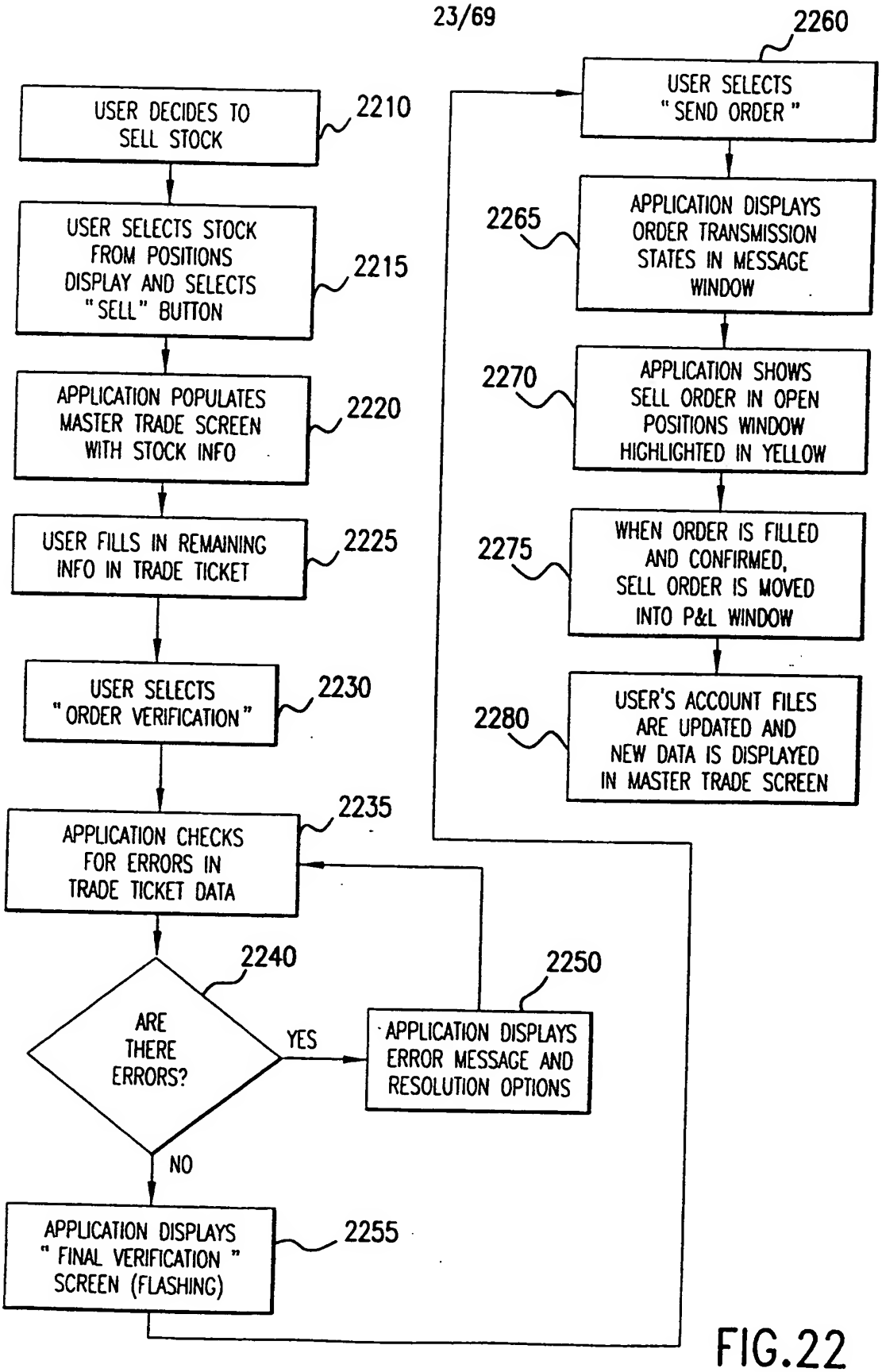

USER DECIDES TO SELL STOCK
2210
USER SELECTS STOCK FROM POSITIONS DISPLAY AND SELECTS "SELL" BUTTON
2215
APPLICATION POPULATES MASTER TRADE SCREEN WITH STOCK INFO
2220
USER FILLS IN REMAINING INFO IN TRADE TICKET
2225
USER SELECTS "ORDER VERIFICATION"
2230
APPLICATION CHECKS FOR ERRORS IN TRADE TICKET DATA
2235
ARE THERE ERRORS?
2240
YES
APPLICATION DISPLAYS ERROR MESSAGE AND RESOLUTION OPTIONS
2250
NO
APPLICATION DISPLAYS "FINAL VERIFICATION" SCREEN (FLASHING)
2255
USER SELECTS "SEND ORDER"
2260
APPLICATION DISPLAYS ORDER TRANSMISSION STATES IN MESSAGE WINDOW
2265
APPLICATION SHOWS SELL ORDER IN OPEN POSITIONS WINDOW HIGHLIGHTED IN YELLOW
2270
WHEN ORDER IS FILLED AND CONFIRMED, SELL ORDER IS MOVED INTO P&L WINDOW
2275
USER'S ACCOUNT FILES ARE UPDATED AND NEW DATA IS DISPLAYED IN MASTER TRADE SCREEN
2280

FIG.22

WEST

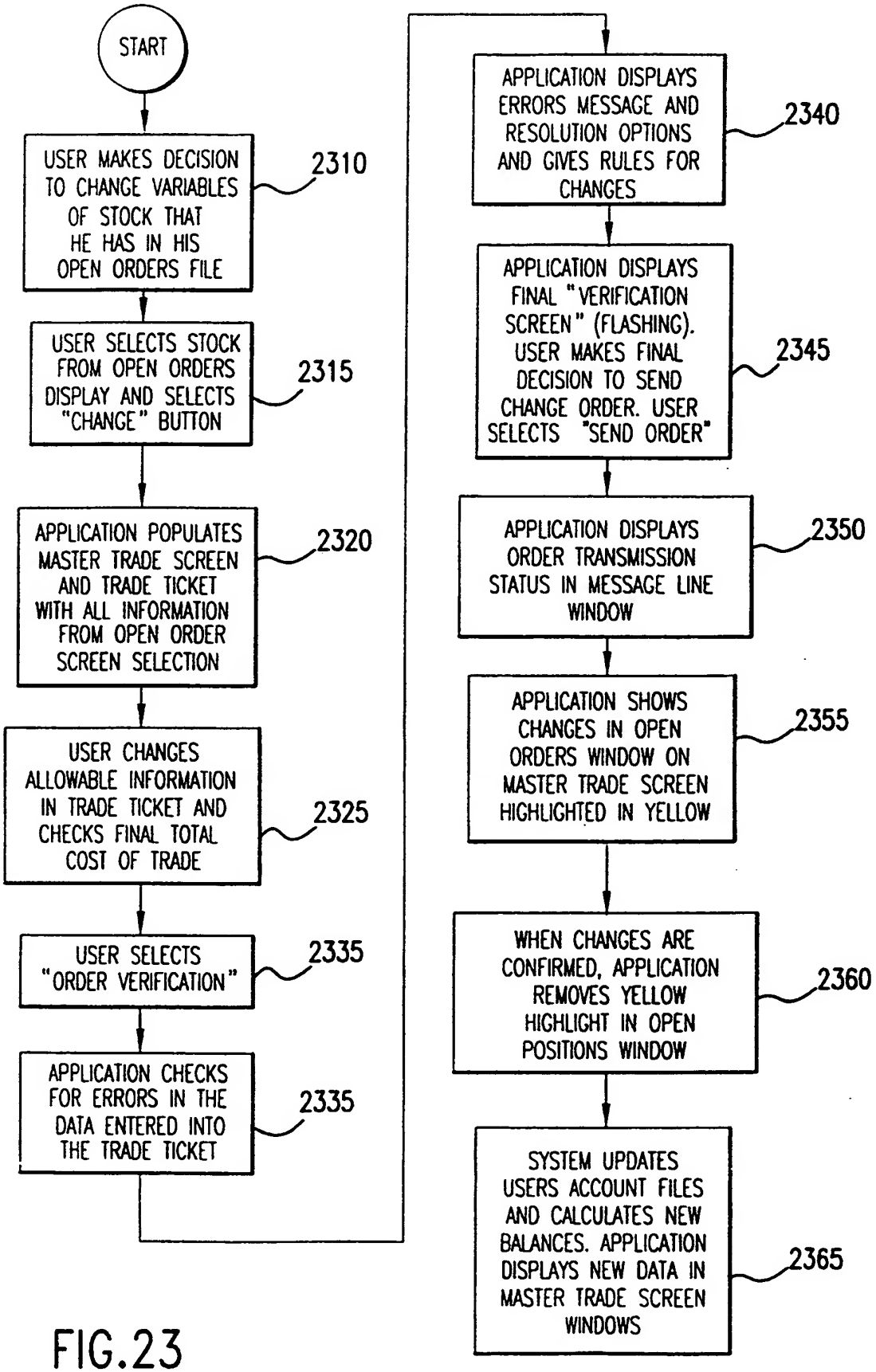

START
USER MAKES DECISION TO CHANGE VARIABLES OF STOCK THAT HE HAS IN HIS OPEN ORDERS FILE
2310
USER SELECTS STOCK FROM OPEN ORDERS DISPLAY AND SELECTS "CHANGE" BUTTON
2315
APPLICATION POPULATES MASTER TRADE SCREEN AND TRADE TICKET WITH ALL INFORMATION FROM OPEN ORDER SCREEN SELECTION
2320
USER CHANGES ALLOWABLE INFORMATION IN TRADE TICKET AND CHECKS FINAL TOTAL COST OF TRADE
2325
USER SELECTS "ORDER VERIFICATION"
2335
APPLICATION CHECKS FOR ERRORS IN THE DATA ENTERED INTO THE TRADE TICKET
2335
APPLICATION DISPLAYS ERRORS MESSAGE AND RESOLUTION OPTIONS AND GIVES RULES FOR CHANGES
2340
APPLICATION DISPLAYS FINAL "VERIFICATION SCREEN" (FLASHING). USER MAKES FINAL DECISION TO SEND CHANGE ORDER. USER SELECTS "SEND ORDER"
2345
APPLICATION DISPLAYS ORDER TRANSMISSION STATUS IN MESSAGE LINE WINDOW
2350
APPLICATION SHOWS CHANGES IN OPEN ORDERS WINDOW ON MASTER TRADE SCREEN HIGHLIGHTED IN YELLOW
2355
WHEN CHANGES ARE CONFIRMED, APPLICATION REMOVES YELLOW HIGHLIGHT IN OPEN POSITIONS WINDOW
2360
SYSTEM UPDATES USERS ACCOUNT FILES AND CALCULATES NEW BALANCES. APPLICATION DISPLAYS NEW DATA IN MASTER TRADE SCREEN WINDOWS
2365

FIG.23

WEST

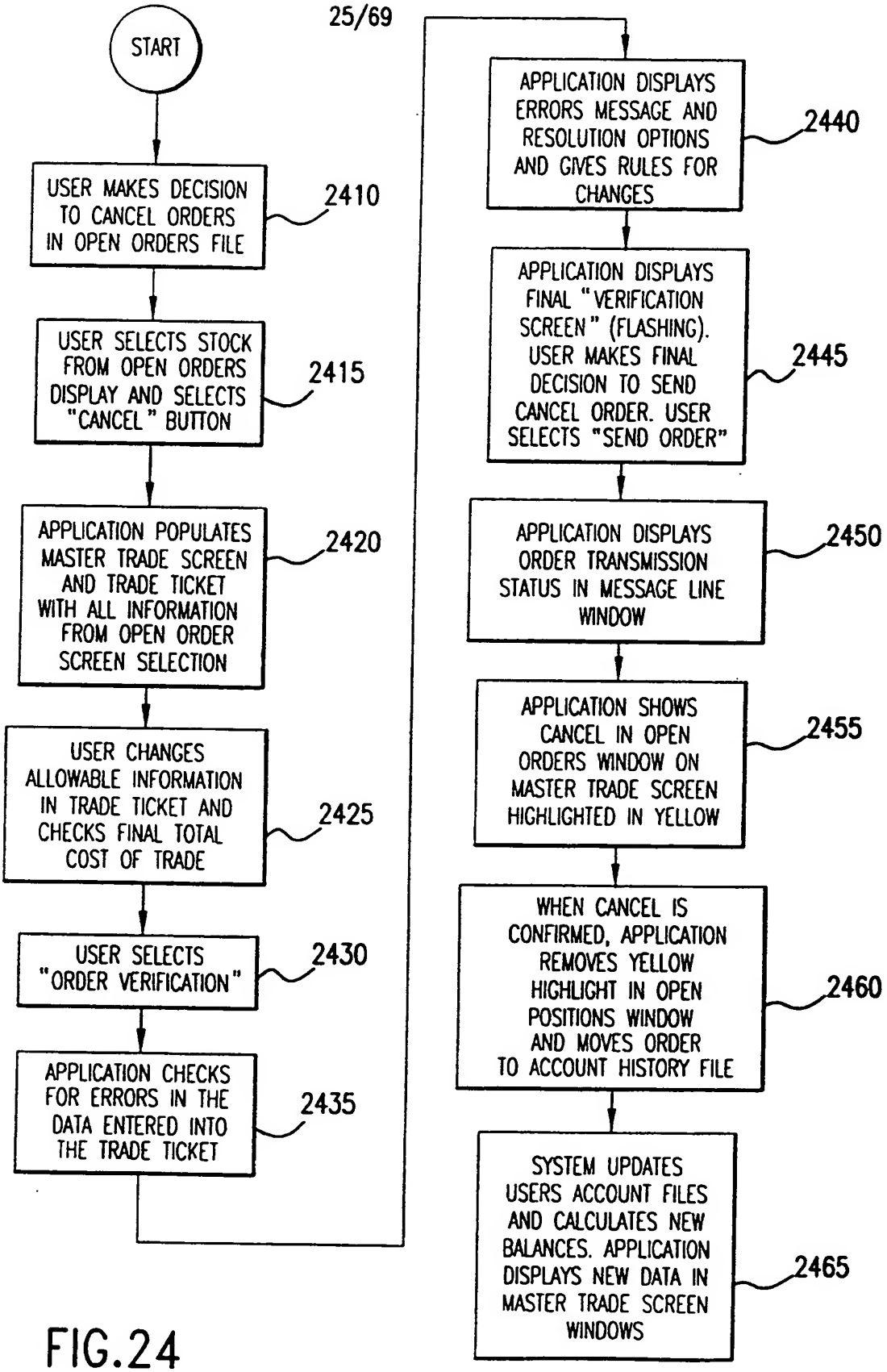

START
USER MAKES DECISION TO CANCEL ORDERS IN OPEN ORDERS FILE
2410
USER SELECTS STOCK FROM OPEN ORDERS DISPLAY AND SELECTS "CANCEL" BUTTON
2415
APPLICATION POPULATES MASTER TRADE SCREEN AND TRADE TICKET WITH ALL INFORMATION FROM OPEN ORDER SCREEN SELECTION
2420
USER CHANGES ALLOWABLE INFORMATION IN TRADE TICKET AND CHECKS FINAL TOTAL COST OF TRADE
2425
USER SELECTS "ORDER VERIFICATION"
2430
APPLICATION CHECKS FOR ERRORS IN THE DATA ENTERED INTO THE TRADE TICKET
2435
APPLICATION DISPLAYS ERRORS MESSAGE AND RESOLUTION OPTIONS AND GIVES RULES FOR CHANGES
2440
APPLICATION DISPLAYS FINAL "VERIFICATION SCREEN" (FLASHING). USER MAKES FINAL DECISION TO SEND CANCEL ORDER. USER SELECTS "SEND ORDER"
2445
APPLICATION DISPLAYS ORDER TRANSMISSION STATUS IN MESSAGE LINE WINDOW
2450
APPLICATION SHOWS CANCEL IN OPEN ORDERS WINDOW ON MASTER TRADE SCREEN HIGHLIGHTED IN YELLOW
2455
WHEN CANCEL IS CONFIRMED, APPLICATION REMOVES YELLOW HIGHLIGHT IN OPEN POSITIONS WINDOW AND MOVES ORDER TO ACCOUNT HISTORY FILE
2460
SYSTEM UPDATES USERS ACCOUNT FILES AND CALCULATES NEW BALANCES. APPLICATION DISPLAYS NEW DATA IN MASTER TRADE SCREEN WINDOWS
2465

FIG.24

WEST

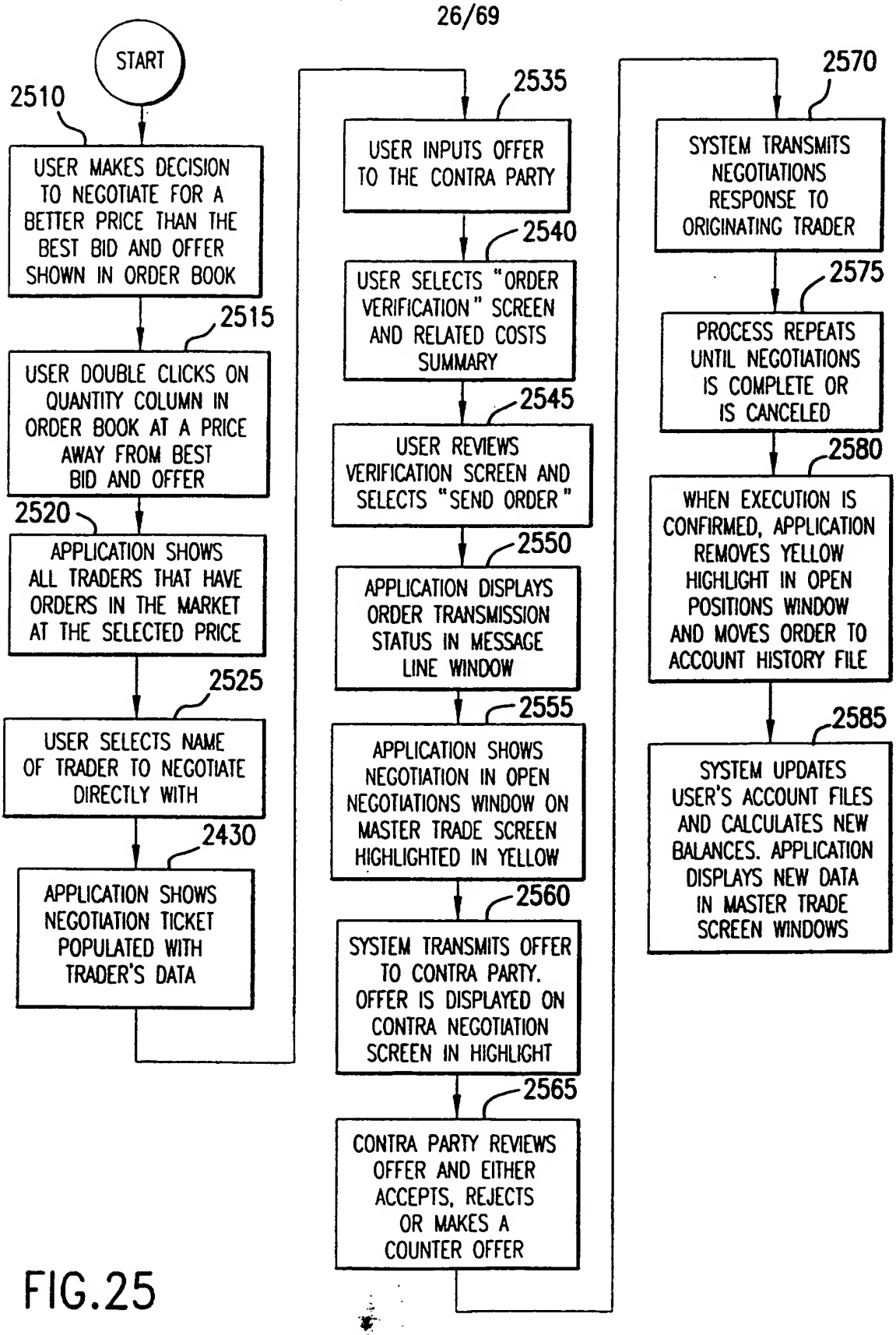

START
2510
USER MAKES DECISION TO NEGOTIATE FOR A BETTER PRICE THAN THE BEST BID AND OFFER SHOWN IN ORDER BOOK
2515
USER DOUBLE CLICKS ON QUANTITY COLUMN IN ORDER BOOK AT A PRICE AWAY FROM BEST BID AND OFFER
2520
APPLICATION SHOWS ALL TRADERS THAT HAVE ORDERS IN THE MARKET AT THE SELECTED PRICE
2525
USER SELECTS NAME OF TRADER TO NEGOTIATE DIRECTLY WITH
2430
APPLICATION SHOWS NEGOTIATION TICKET POPULATED WITH TRADER'S DATA
2535
USER INPUTS OFFER TO THE CONTRA PARTY
2540
USER SELECTS "ORDER VERIFICATION" SCREEN AND RELATED COSTS SUMMARY
2545
USER REVIEWS VERIFICATION SCREEN AND SELECTS "SEND ORDER"
2550
APPLICATION DISPLAYS ORDER TRANSMISSION STATUS IN MESSAGE LINE WINDOW
2555
APPLICATION SHOWS NEGOTIATION IN OPEN NEGOTIATIONS WINDOW ON MASTER TRADE SCREEN HIGHLIGHTED IN YELLOW
2560
SYSTEM TRANSMITS OFFER TO CONTRA PARTY. OFFER IS DISPLAYED ON CONTRA NEGOTIATION SCREEN IN HIGHLIGHT
2565
CONTRA PARTY REVIEWS OFFER AND EITHER ACCEPTS, REJECTS OR MAKES A COUNTER OFFER
2570
SYSTEM TRANSMITS NEGOTIATIONS RESPONSE TO ORIGINATING TRADER
2575
PROCESS REPEATS UNTIL NEGOTIATIONS IS COMPLETE OR IS CANCELED
2580
WHEN EXECUTION IS CONFIRMED, APPLICATION REMOVES YELLOW HIGHLIGHT IN OPEN POSITIONS WINDOW AND MOVES ORDER TO ACCOUNT HISTORY FILE
2585
SYSTEM UPDATES USER'S ACCOUNT FILES AND CALCULATES NEW BALANCES. APPLICATION DISPLAYS NEW DATA IN MASTER TRADE SCREEN WINDOWS

FIG.25

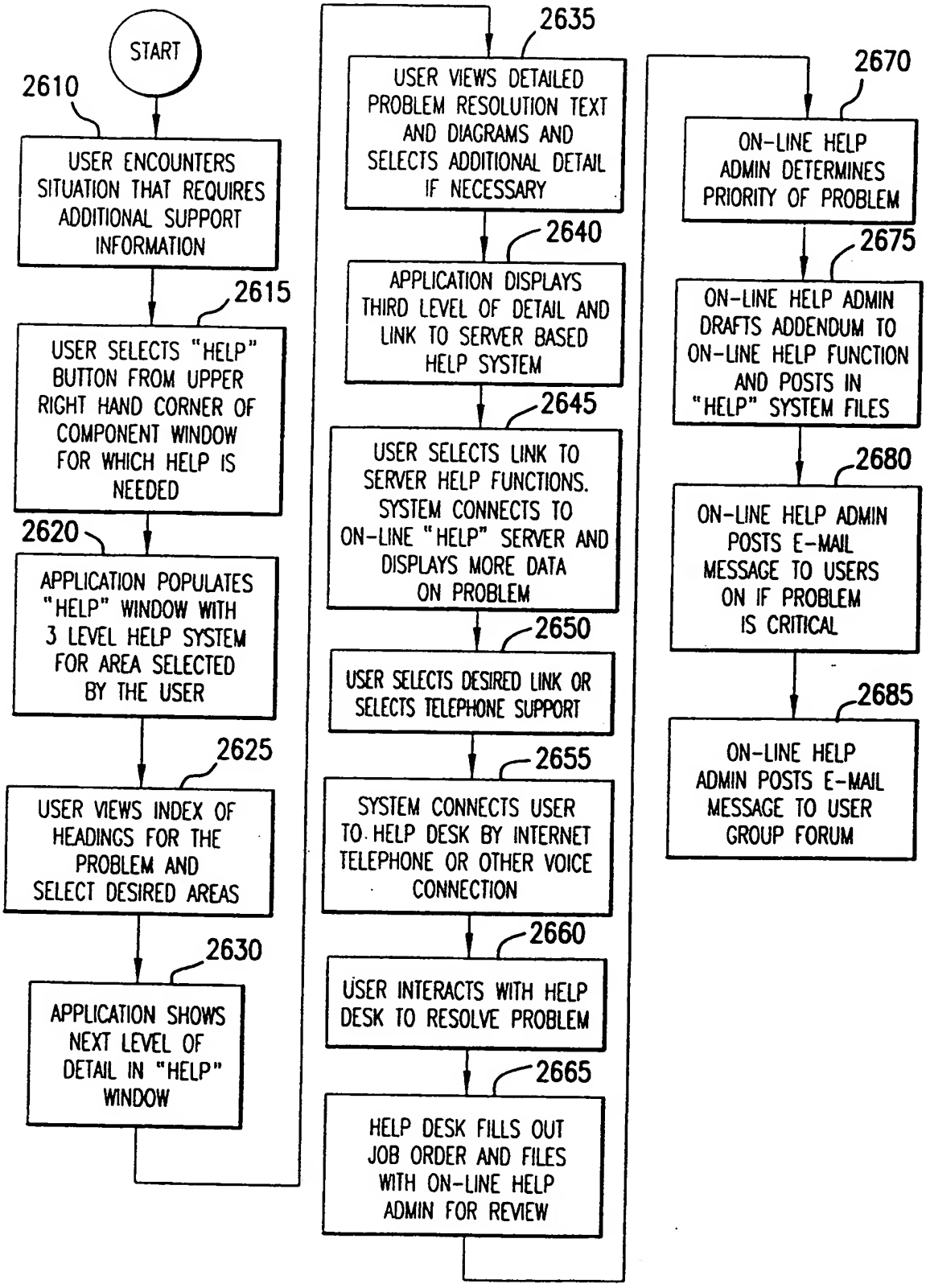

START
2610
USER ENCOUNTERS SITUATION THAT REQUIRES ADDITIONAL SUPPORT INFORMATION
2615
USER SELECTS "HELP" BUTTON FROM UPPER RIGHT HAND CORNER OF COMPONENT WINDOW FOR WHICH HELP IS NEEDED
2620
APPLICATION POPULATES "HELP" WINDOW WITH 3 LEVEL HELP SYSTEM FOR AREA SELECTED BY THE USER
2625
USER VIEWS INDEX OF HEADINGS FOR THE PROBLEM AND SELECT DESIRED AREAS
2630
APPLICATION SHOWS NEXT LEVEL OF DETAIL IN "HELP" WINDOW
2635
USER VIEWS DETAILED PROBLEM RESOLUTION TEXT AND DIAGRAMS AND SELECTS ADDITIONAL DETAIL IF NECESSARY
2640
APPLICATION DISPLAYS THIRD LEVEL OF DETAIL AND LINK TO SERVER BASED HELP SYSTEM
2645
USER SELECTS LINK TO SERVER HELP FUNCTIONS. SYSTEM CONNECTS TO ON-LINE "HELP" SERVER AND DISPLAYS MORE DATA ON PROBLEM
2650
USER SELECTS DESIRED LINK OR SELECTS TELEPHONE SUPPORT
2655
SYSTEM CONNECTS USER TO HELP DESK BY INTERNET TELEPHONE OR OTHER VOICE CONNECTION
2660
USER INTERACTS WITH HELP DESK TO RESOLVE PROBLEM
2665
HELP DESK FILLS OUT JOB ORDER AND FILES WITH ON-LINE HELP ADMIN FOR REVIEW
2670
ON-LINE HELP ADMIN DETERMINES PRIORITY OF PROBLEM
2675
ON-LINE HELP ADMIN DRAFTS ADDENDUM TO ON-LINE HELP FUNCTION AND POSTS IN "HELP" SYSTEM FILES
2680
ON-LINE HELP ADMIN POSTS E-MAIL MESSAGE TO USERS ON IF PROBLEM IS CRITICAL
2685
ON-LINE HELP ADMIN POSTS E-MAIL MESSAGE TO USER GROUP FORUM

FIG.26

WEST

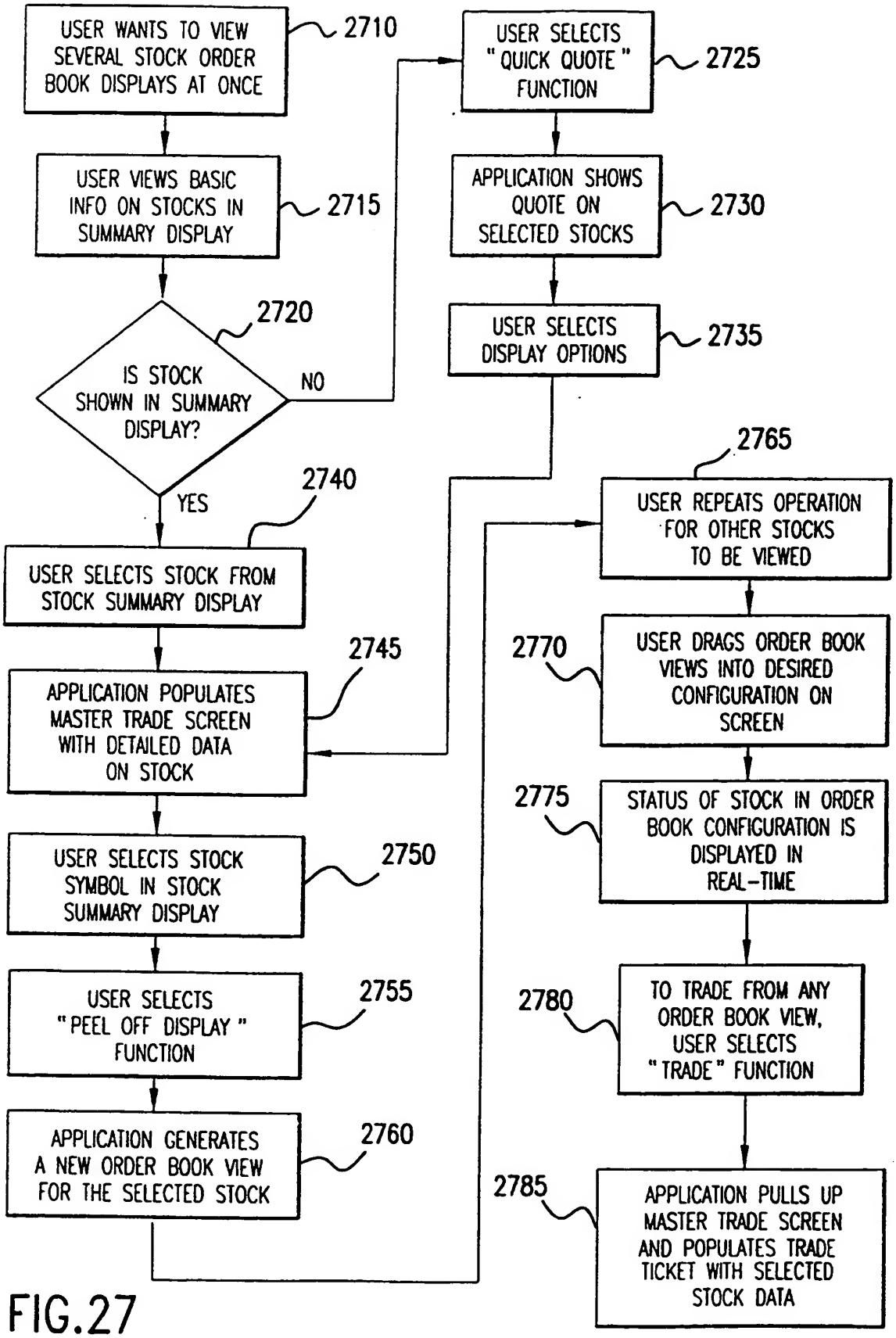

USER WANTS TO VIEW SEVERAL STOCK ORDER BOOK DISPLAYS AT ONCE
2710
USER VIEWS BASIC INFO ON STOCKS IN SUMMARY DISPLAY
2715
IS STOCK SHOWN IN SUMMARY DISPLAY?
2720
NO
YES
USER SELECTS STOCK FROM STOCK SUMMARY DISPLAY
2740
APPLICATION POPULATES MASTER TRADE SCREEN WITH DETAILED DATA ON STOCK
2745
USER SELECTS STOCK SYMBOL IN STOCK SUMMARY DISPLAY
2750
USER SELECTS "PEEL OFF DISPLAY" FUNCTION
2755
APPLICATION GENERATES A NEW ORDER BOOK VIEW FOR THE SELECTED STOCK
2760
USER SELECTS "QUICK QUOTE" FUNCTION
2725
APPLICATION SHOWS QUOTE ON SELECTED STOCKS
2730
USER SELECTS DISPLAY OPTIONS
2735
USER REPEATS OPERATION FOR OTHER STOCKS TO BE VIEWED
2765
USER DRAGS ORDER BOOK VIEWS INTO DESIRED CONFIGURATION ON SCREEN
2770
STATUS OF STOCK IN ORDER BOOK CONFIGURATION IS DISPLAYED IN REAL-TIME
2775
TO TRADE FROM ANY ORDER BOOK VIEW, USER SELECTS "TRADE" FUNCTION
2780
APPLICATION PULLS UP MASTER TRADE SCREEN AND POPULATES TRADE TICKET WITH SELECTED STOCK DATA
2785

FIG.27

WEST

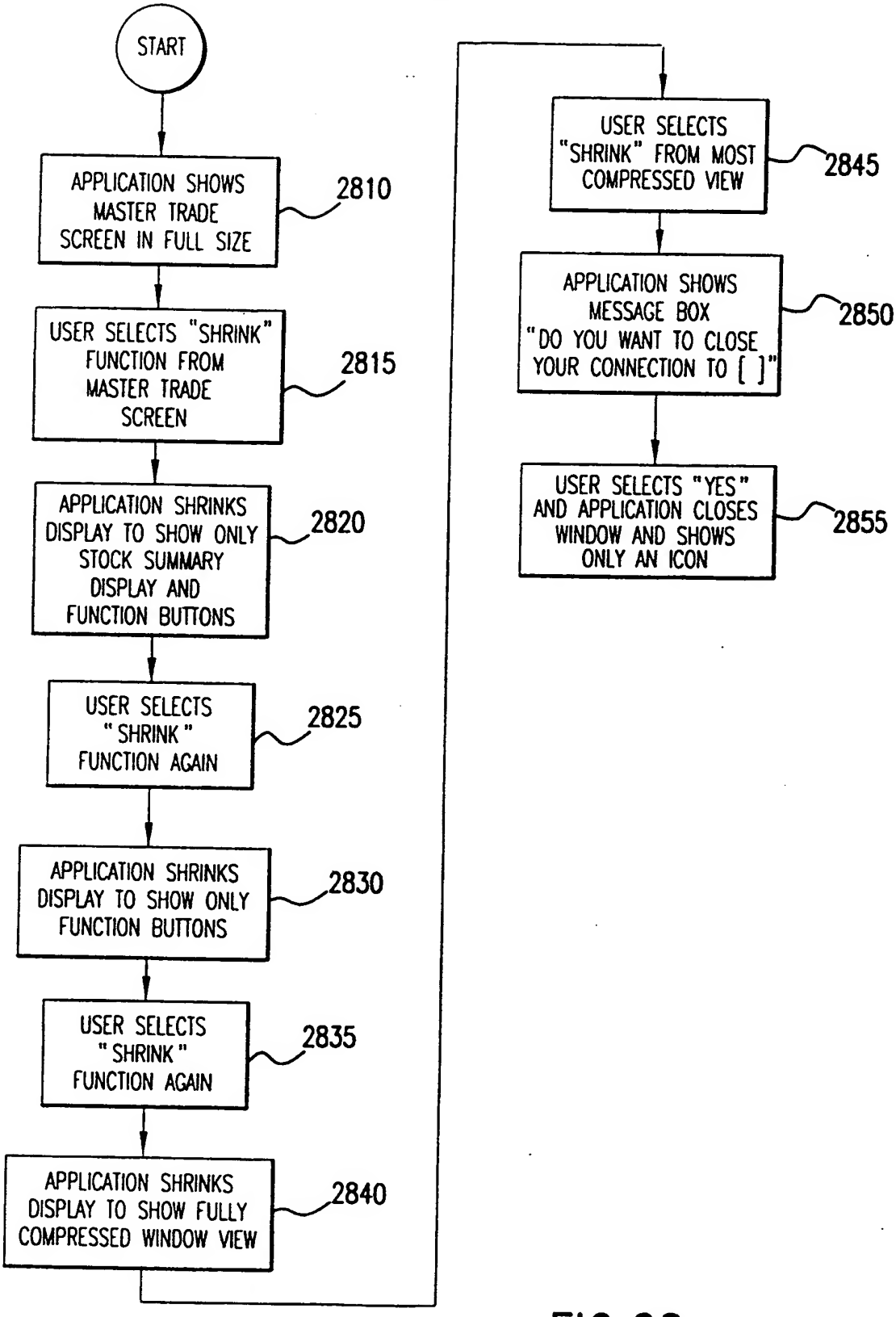

START
APPLICATION SHOWS MASTER TRADE SCREEN IN FULL SIZE
2810
USER SELECTS "SHRINK" FUNCTION FROM MASTER TRADE SCREEN
2815
APPLICATION SHRINKS DISPLAY TO SHOW ONLY STOCK SUMMARY DISPLAY AND FUNCTION BUTTONS
2820
USER SELECTS "SHRINK" FUNCTION AGAIN
2825
APPLICATION SHRINKS DISPLAY TO SHOW ONLY FUNCTION BUTTONS
2830
USER SELECTS "SHRINK" FUNCTION AGAIN
2835
APPLICATION SHRINKS DISPLAY TO SHOW FULLY COMPRESSED WINDOW VIEW
2840
USER SELECTS "SHRINK" FROM MOST COMPRESSED VIEW
2845
APPLICATION SHOWS MESSAGE BOX "DO YOU WANT TO CLOSE YOUR CONNECTION TO [ ]"
2850
USER SELECTS "YES" AND APPLICATION CLOSES WINDOW AND SHOWS ONLY AN ICON
2855

FIG.28

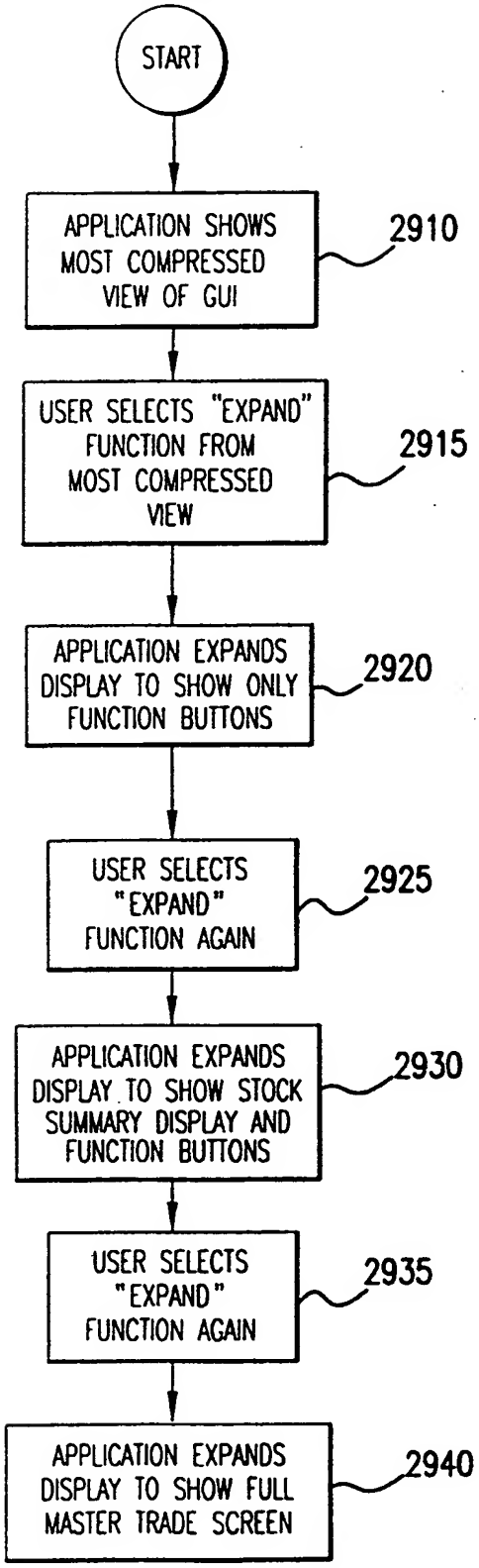

START
APPLICATION SHOWS MOST COMPRESSED VIEW OF GUI
2910
USER SELECTS "EXPAND" FUNCTION FROM MOST COMPRESSED VIEW
2915
APPLICATION EXPANDS DISPLAY TO SHOW ONLY FUNCTION BUTTONS
2920
USER SELECTS "EXPAND" FUNCTION AGAIN
2925
APPLICATION EXPANDS DISPLAY TO SHOW STOCK SUMMARY DISPLAY AND FUNCTION BUTTONS
2930
USER SELECTS "EXPAND" FUNCTION AGAIN
2935
APPLICATION EXPANDS DISPLAY TO SHOW FULL MASTER TRADE SCREEN
2940

FIG.29

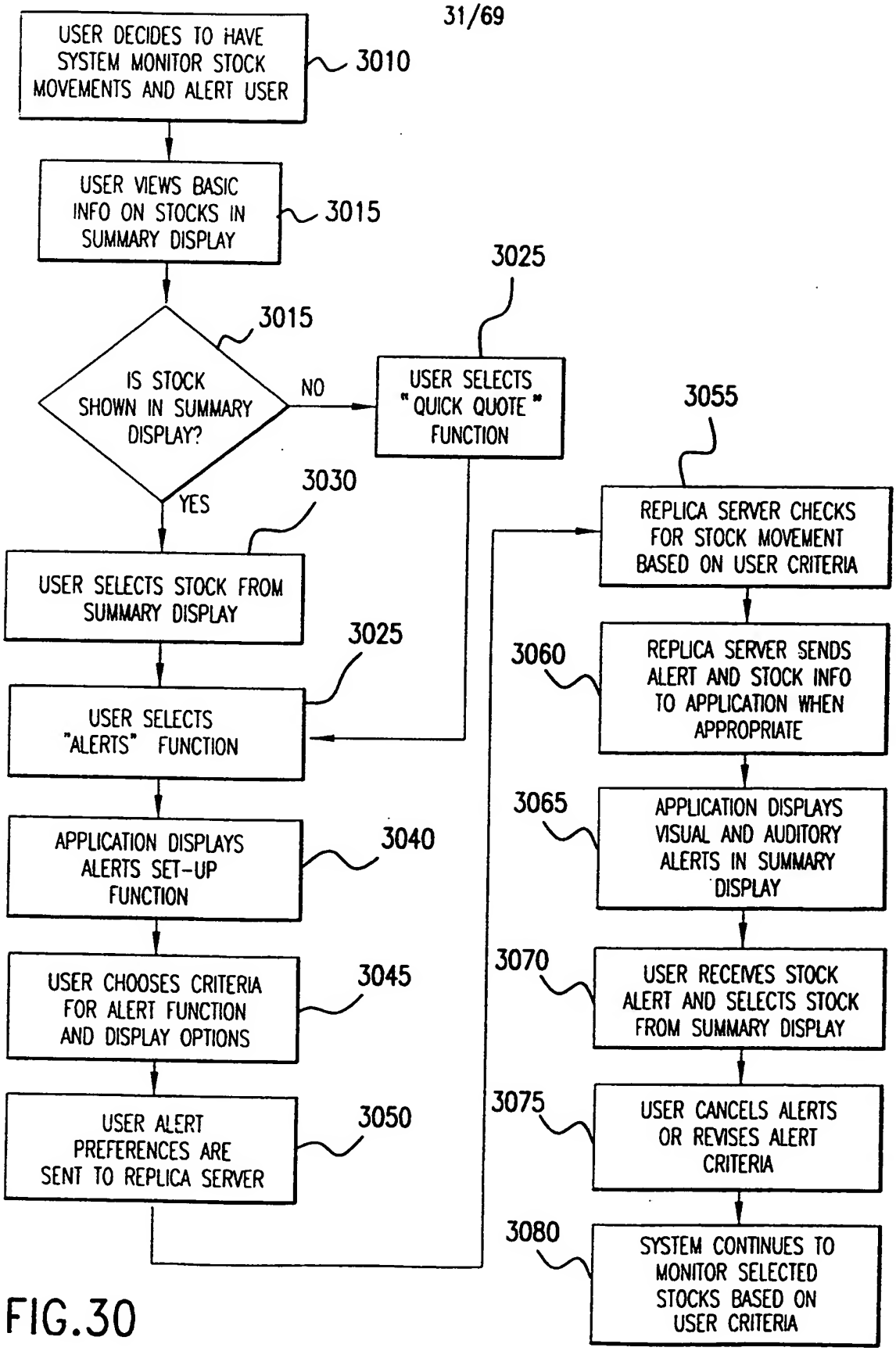

USER DECIDES TO HAVE SYSTEM MONITOR STOCK MOVEMENTS AND ALERT USER
3010
USER VIEWS BASIC INFO ON STOCKS IN SUMMARY DISPLAY
3015
3015
IS STOCK SHOWN IN SUMMARY DISPLAY?
NO
YES
3025
USER SELECTS "QUICK QUOTE" FUNCTION
3030
USER SELECTS STOCK FROM SUMMARY DISPLAY
3025
USER SELECTS "ALERTS" FUNCTION
APPLICATION DISPLAYS ALERTS SET-UP FUNCTION
3040
USER CHOOSES CRITERIA FOR ALERT FUNCTION AND DISPLAY OPTIONS
3045
USER ALERT PREFERENCES ARE SENT TO REPLICA SERVER
3050
3055
REPLICA SERVER CHECKS FOR STOCK MOVEMENT BASED ON USER CRITERIA
3060
REPLICA SERVER SENDS ALERT AND STOCK INFO TO APPLICATION WHEN APPROPRIATE
3065
APPLICATION DISPLAYS VISUAL AND AUDITORY ALERTS IN SUMMARY DISPLAY
3070
USER RECEIVES STOCK ALERT AND SELECTS STOCK FROM SUMMARY DISPLAY
3075
USER CANCELS ALERTS OR REVISES ALERT CRITERIA
3080
SYSTEM CONTINUES TO MONITOR SELECTED STOCKS BASED ON USER CRITERIA

FIG.30

WEST

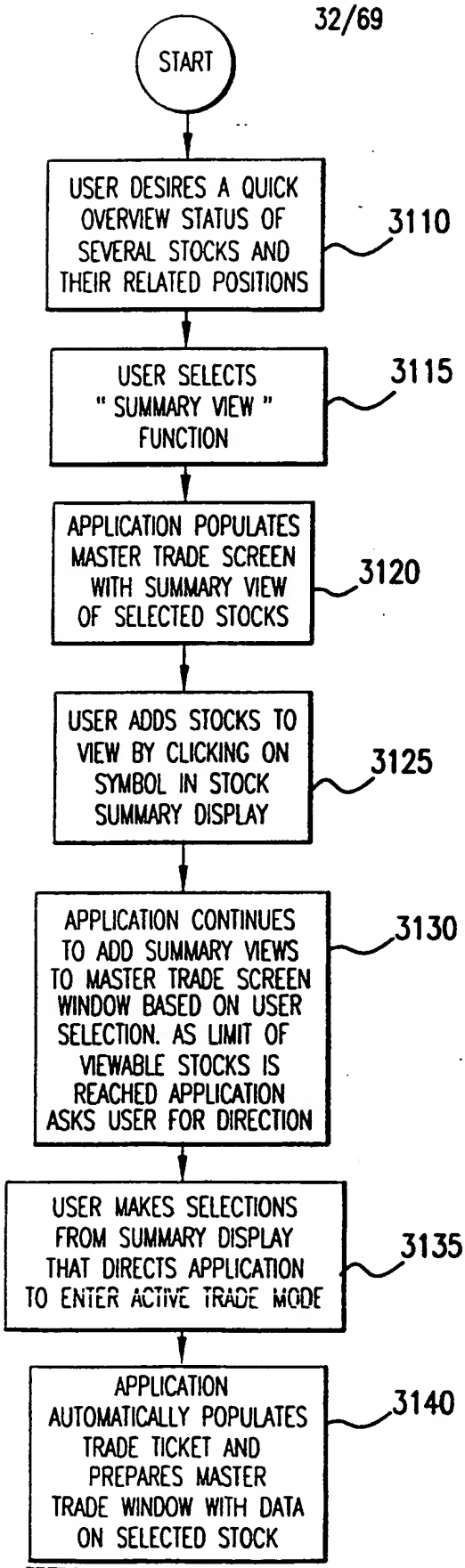

START
USER DESIRES A QUICK OVERVIEW STATUS OF SEVERAL STOCKS AND THEIR RELATED POSITIONS
3110
USER SELECTS " SUMMARY VIEW " FUNCTION
3115
APPLICATION POPULATES MASTER TRADE SCREEN WITH SUMMARY VIEW OF SELECTED STOCKS
3120
USER ADDS STOCKS TO VIEW BY CLICKING ON SYMBOL IN STOCK SUMMARY DISPLAY
3125
APPLICATION CONTINUES TO ADD SUMMARY VIEWS TO MASTER TRADE SCREEN WINDOW BASED ON USER SELECTION. AS LIMIT OF VIEWABLE STOCKS IS REACHED APPLICATION ASKS USER FOR DIRECTION
3130
USER MAKES SELECTIONS FROM SUMMARY DISPLAY THAT DIRECTS APPLICATION TO ENTER ACTIVE TRADE MODE
3135
APPLICATION AUTOMATICALLY POPULATES TRADE TICKET AND PREPARES MASTER TRADE WINDOW WITH DATA ON SELECTED STOCK
3140

FIG.31

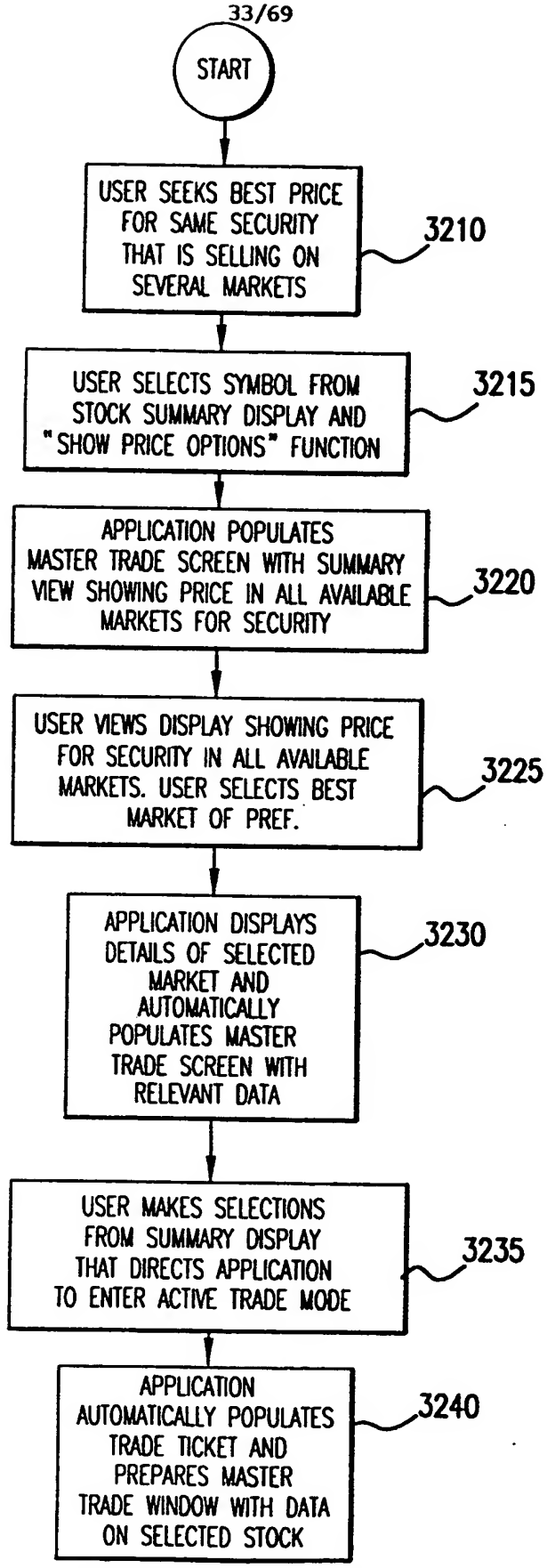

START
USER SEEKS BEST PRICE FOR SAME SECURITY THAT IS SELLING ON SEVERAL MARKETS
3210
USER SELECTS SYMBOL FROM STOCK SUMMARY DISPLAY AND "SHOW PRICE OPTIONS" FUNCTION
3215
APPLICATION POPULATES MASTER TRADE SCREEN WITH SUMMARY VIEW SHOWING PRICE IN ALL AVAILABLE MARKETS FOR SECURITY
3220
USER VIEWS DISPLAY SHOWING PRICE FOR SECURITY IN ALL AVAILABLE MARKETS. USER SELECTS BEST MARKET OF PREF.
3225
APPLICATION DISPLAYS DETAILS OF SELECTED MARKET AND AUTOMATICALLY POPULATES MASTER TRADE SCREEN WITH RELEVANT DATA
3230
USER MAKES SELECTIONS FROM SUMMARY DISPLAY THAT DIRECTS APPLICATION TO ENTER ACTIVE TRADE MODE
3235
APPLICATION AUTOMATICALLY POPULATES TRADE TICKET AND PREPARES MASTER TRADE WINDOW WITH DATA ON SELECTED STOCK
3240

FIG.32

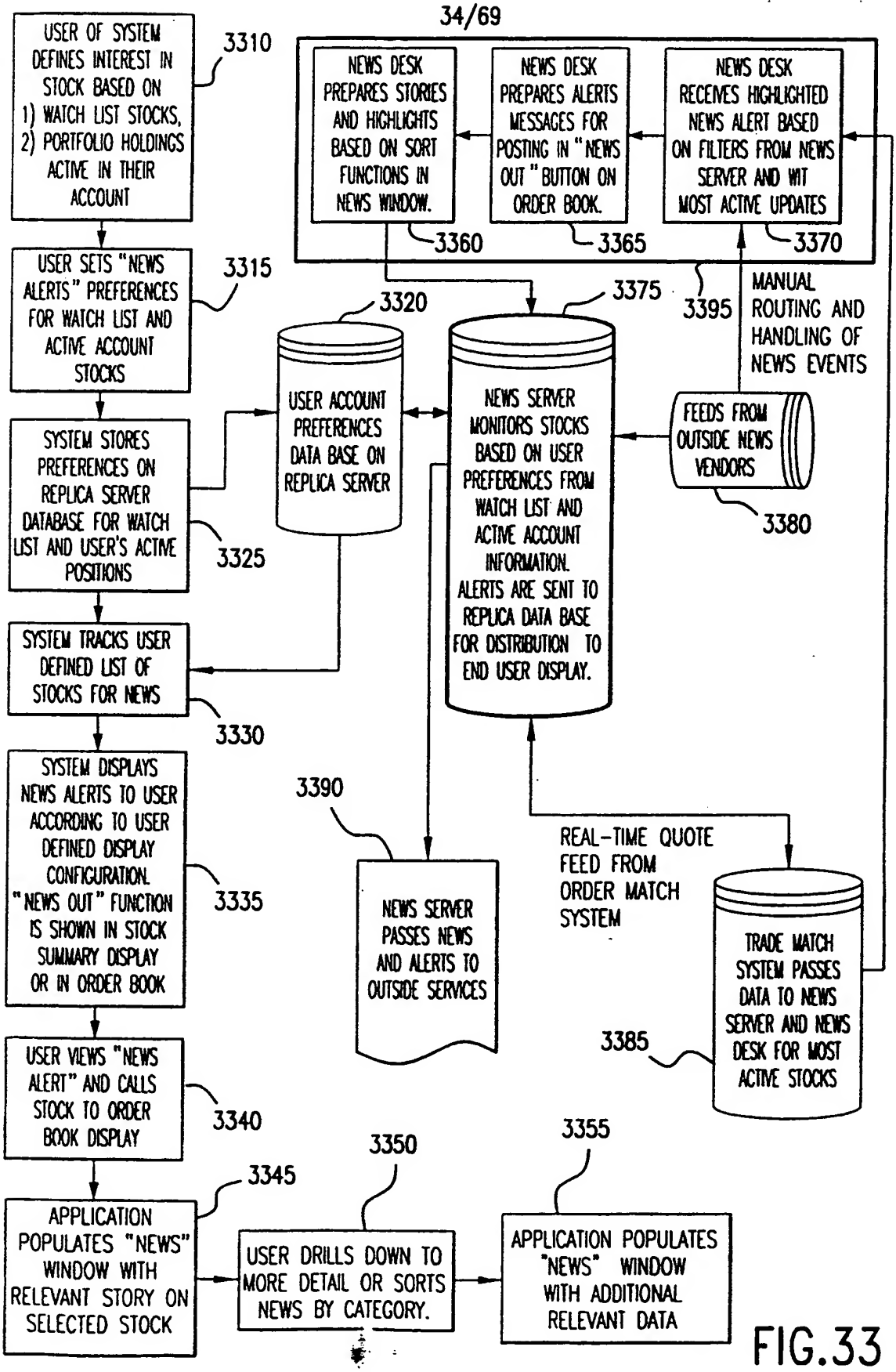

USER OF SYSTEM DEFINES INTEREST IN STOCK BASED ON 1) WATCH LIST STOCKS, 2) PORTFOLIO HOLDINGS ACTIVE IN THEIR ACCOUNT
3310
USER SETS "NEWS ALERTS" PREFERENCES FOR WATCH LIST AND ACTIVE ACCOUNT STOCKS
3315
SYSTEM STORES PREFERENCES ON REPLICA SERVER DATABASE FOR WATCH LIST AND USER'S ACTIVE POSITIONS
3325
SYSTEM TRACKS USER DEFINED LIST OF STOCKS FOR NEWS
3330
SYSTEM DISPLAYS NEWS ALERTS TO USER ACCORDING TO USER DEFINED DISPLAY CONFIGURATION. "NEWS OUT" FUNCTION IS SHOWN IN STOCK SUMMARY DISPLAY OR IN ORDER BOOK
3335
USER VIEWS "NEWS ALERT" AND CALLS STOCK TO ORDER BOOK DISPLAY
3340
APPLICATION POPULATES "NEWS" WINDOW WITH RELEVANT STORY ON SELECTED STOCK
3345
USER DRILLS DOWN TO MORE DETAIL OR SORTS NEWS BY CATEGORY.
3350
APPLICATION POPULATES "NEWS" WINDOW WITH ADDITIONAL RELEVANT DATA
3355
NEWS DESK PREPARES STORIES AND HIGHLIGHTS BASED ON SORT FUNCTIONS IN NEWS WINDOW.
3360
NEWS DESK PREPARES ALERTS MESSAGES FOR POSTING IN "NEWS OUT" BUTTON ON ORDER BOOK.
3365
NEWS DESK RECEIVES HIGHLIGHTED NEWS ALERT BASED ON FILTERS FROM NEWS SERVER AND WIT MOST ACTIVE UPDATES
3370
3395
MANUAL ROUTING AND HANDLING OF NEWS EVENTS
3320
USER ACCOUNT PREFERENCES DATA BASE ON REPLICA SERVER
3375
NEWS SERVER MONITORS STOCKS BASED ON USER PREFERENCES FROM WATCH LIST AND ACTIVE ACCOUNT INFORMATION. ALERTS ARE SENT TO REPLICA DATA BASE FOR DISTRIBUTION TO END USER DISPLAY.
FEEDS FROM OUTSIDE NEWS VENDORS
3380
3390
NEWS SERVER PASSES NEWS AND ALERTS TO OUTSIDE SERVICES
REAL-TIME QUOTE FEED FROM ORDER MATCH SYSTEM
TRADE MATCH SYSTEM PASSES DATA TO NEWS SERVER AND NEWS DESK FOR MOST ACTIVE STOCKS
3385

FIG.33

WEST

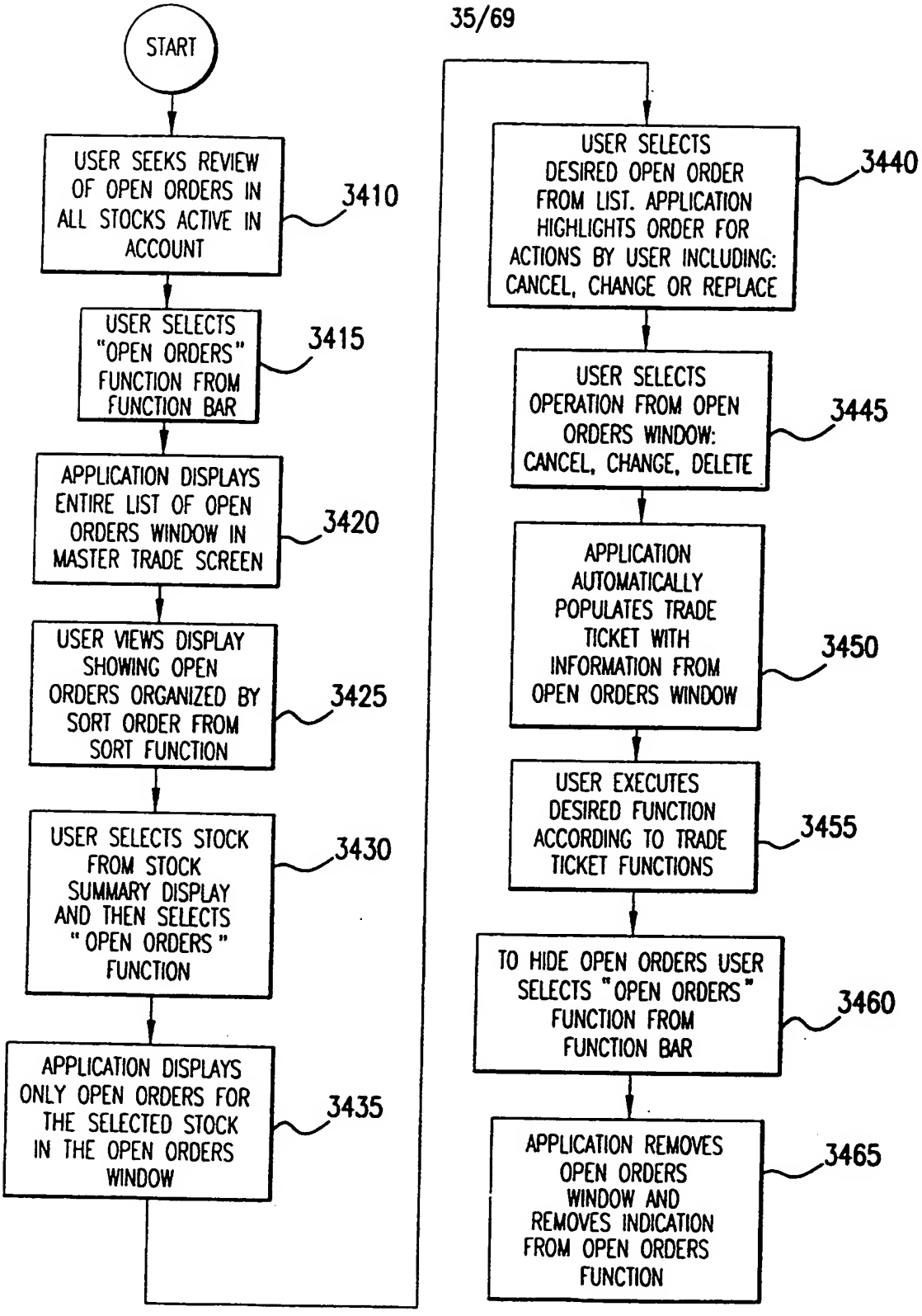

START
USER SEEKS REVIEW OF OPEN ORDERS IN ALL STOCKS ACTIVE IN ACCOUNT
3410
USER SELECTS "OPEN ORDERS" FUNCTION FROM FUNCTION BAR
3415
APPLICATION DISPLAYS ENTIRE LIST OF OPEN ORDERS WINDOW IN MASTER TRADE SCREEN
3420
USER VIEWS DISPLAY SHOWING OPEN ORDERS ORGANIZED BY SORT ORDER FROM SORT FUNCTION
3425
USER SELECTS STOCK FROM STOCK SUMMARY DISPLAY AND THEN SELECTS "OPEN ORDERS" FUNCTION
3430
APPLICATION DISPLAYS ONLY OPEN ORDERS FOR THE SELECTED STOCK IN THE OPEN ORDERS WINDOW
3435
USER SELECTS DESIRED OPEN ORDER FROM LIST. APPLICATION HIGHLIGHTS ORDER FOR ACTIONS BY USER INCLUDING: CANCEL, CHANGE OR REPLACE
3440
USER SELECTS OPERATION FROM OPEN ORDERS WINDOW: CANCEL, CHANGE, DELETE
3445
APPLICATION AUTOMATICALLY POPULATES TRADE TICKET WITH INFORMATION FROM OPEN ORDERS WINDOW
3450
USER EXECUTES DESIRED FUNCTION ACCORDING TO TRADE TICKET FUNCTIONS
3455
TO HIDE OPEN ORDERS USER SELECTS "OPEN ORDERS" FUNCTION FROM FUNCTION BAR
3460
APPLICATION REMOVES OPEN ORDERS WINDOW AND REMOVES INDICATION FROM OPEN ORDERS FUNCTION
3465

FIG.34

WEST

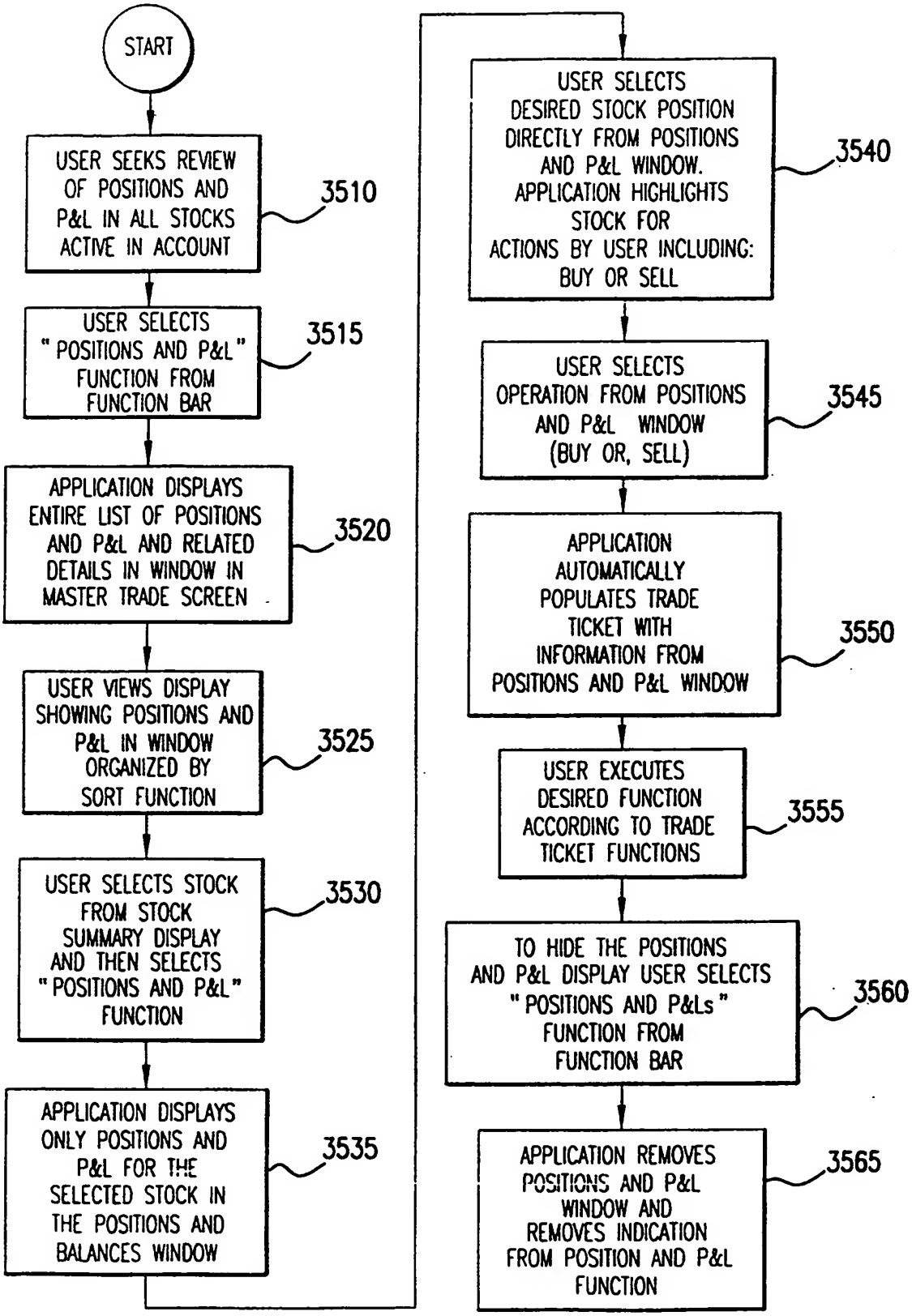

START
USER SEEKS REVIEW OF POSITIONS AND P&L IN ALL STOCKS ACTIVE IN ACCOUNT
3510
USER SELECTS " POSITIONS AND P&L" FUNCTION FROM FUNCTION BAR
3515
APPLICATION DISPLAYS ENTIRE LIST OF POSITIONS AND P&L AND RELATED DETAILS IN WINDOW IN MASTER TRADE SCREEN
3520
USER VIEWS DISPLAY SHOWING POSITIONS AND P&L IN WINDOW ORGANIZED BY SORT FUNCTION
3525
USER SELECTS STOCK FROM STOCK SUMMARY DISPLAY AND THEN SELECTS " POSITIONS AND P&L" FUNCTION
3530
APPLICATION DISPLAYS ONLY POSITIONS AND P&L FOR THE SELECTED STOCK IN THE POSITIONS AND BALANCES WINDOW
3535
USER SELECTS DESIRED STOCK POSITION DIRECTLY FROM POSITIONS AND P&L WINDOW. APPLICATION HIGHLIGHTS STOCK FOR ACTIONS BY USER INCLUDING: BUY OR SELL
3540
USER SELECTS OPERATION FROM POSITIONS AND P&L WINDOW (BUY OR, SELL)
3545
APPLICATION AUTOMATICALLY POPULATES TRADE TICKET WITH INFORMATION FROM POSITIONS AND P&L WINDOW
3550
USER EXECUTES DESIRED FUNCTION ACCORDING TO TRADE TICKET FUNCTIONS
3555
TO HIDE THE POSITIONS AND P&L DISPLAY USER SELECTS " POSITIONS AND P&Ls " FUNCTION FROM FUNCTION BAR
3560
APPLICATION REMOVES POSITIONS AND P&L WINDOW AND REMOVES INDICATION FROM POSITION AND P&L FUNCTION
3565

FIG.35

WEST

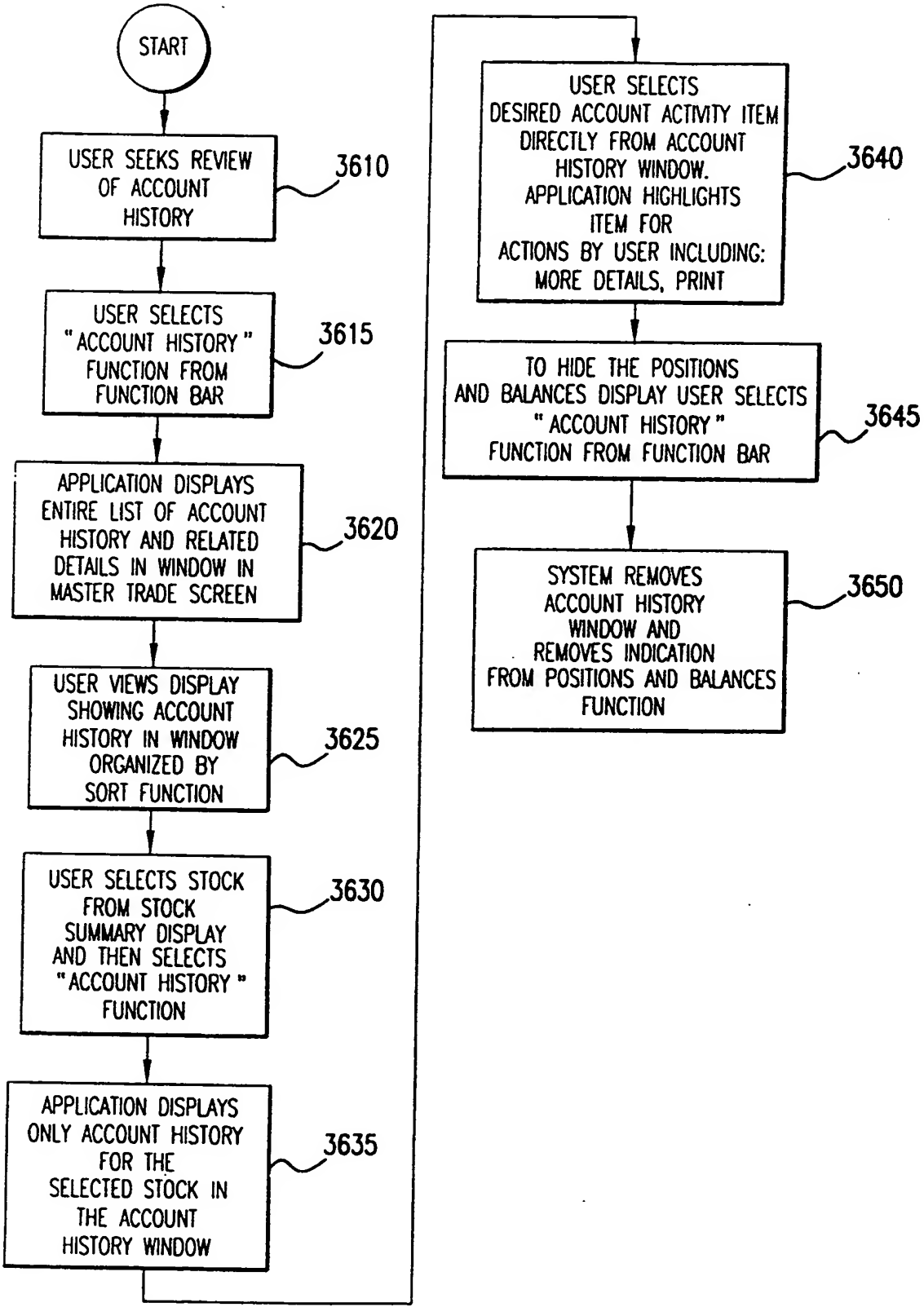

START
USER SEEKS REVIEW OF ACCOUNT HISTORY
3610
USER SELECTS "ACCOUNT HISTORY" FUNCTION FROM FUNCTION BAR
3615
APPLICATION DISPLAYS ENTIRE LIST OF ACCOUNT HISTORY AND RELATED DETAILS IN WINDOW IN MASTER TRADE SCREEN
3620
USER VIEWS DISPLAY SHOWING ACCOUNT HISTORY IN WINDOW ORGANIZED BY SORT FUNCTION
3625
USER SELECTS STOCK FROM STOCK SUMMARY DISPLAY AND THEN SELECTS "ACCOUNT HISTORY" FUNCTION
3630
APPLICATION DISPLAYS ONLY ACCOUNT HISTORY FOR THE SELECTED STOCK IN THE ACCOUNT HISTORY WINDOW
3635
USER SELECTS DESIRED ACCOUNT ACTIVITY ITEM DIRECTLY FROM ACCOUNT HISTORY WINDOW. APPLICATION HIGHLIGHTS ITEM FOR ACTIONS BY USER INCLUDING: MORE DETAILS, PRINT
3640
TO HIDE THE POSITIONS AND BALANCES DISPLAY USER SELECTS "ACCOUNT HISTORY" FUNCTION FROM FUNCTION BAR
3645
SYSTEM REMOVES ACCOUNT HISTORY WINDOW AND REMOVES INDICATION FROM POSITIONS AND BALANCES FUNCTION
3650

FIG.36

WEST

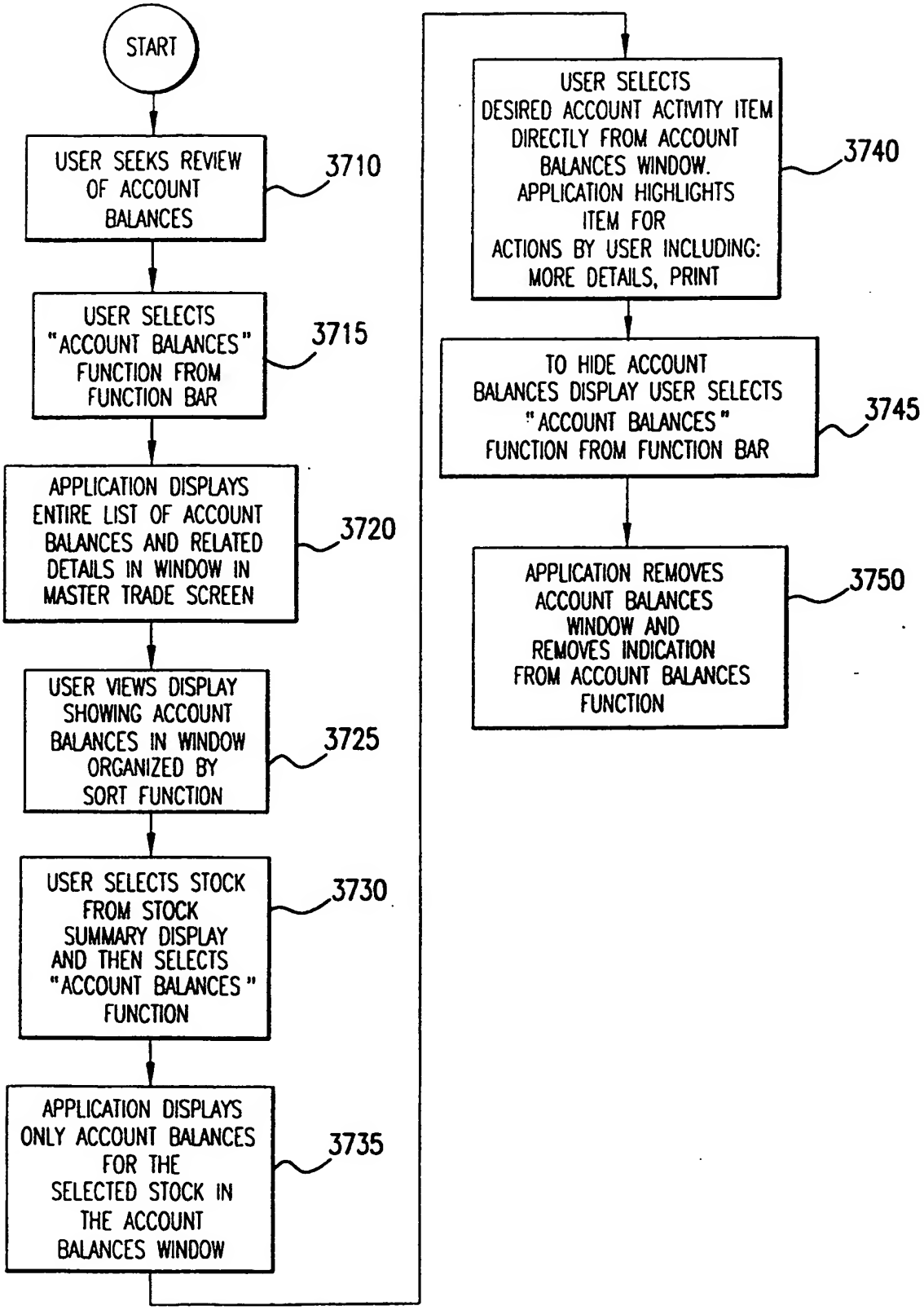

START
USER SEEKS REVIEW OF ACCOUNT BALANCES
3710
USER SELECTS "ACCOUNT BALANCES" FUNCTION FROM FUNCTION BAR
3715
APPLICATION DISPLAYS ENTIRE LIST OF ACCOUNT BALANCES AND RELATED DETAILS IN WINDOW IN MASTER TRADE SCREEN
3720
USER VIEWS DISPLAY SHOWING ACCOUNT BALANCES IN WINDOW ORGANIZED BY SORT FUNCTION
3725
USER SELECTS STOCK FROM STOCK SUMMARY DISPLAY AND THEN SELECTS "ACCOUNT BALANCES" FUNCTION
3730
APPLICATION DISPLAYS ONLY ACCOUNT BALANCES FOR THE SELECTED STOCK IN THE ACCOUNT BALANCES WINDOW
3735
USER SELECTS DESIRED ACCOUNT ACTIVITY ITEM DIRECTLY FROM ACCOUNT BALANCES WINDOW. APPLICATION HIGHLIGHTS ITEM FOR ACTIONS BY USER INCLUDING: MORE DETAILS, PRINT
3740
TO HIDE ACCOUNT BALANCES DISPLAY USER SELECTS "ACCOUNT BALANCES" FUNCTION FROM FUNCTION BAR
3745
APPLICATION REMOVES ACCOUNT BALANCES WINDOW AND REMOVES INDICATION FROM ACCOUNT BALANCES FUNCTION
3750

FIG.37

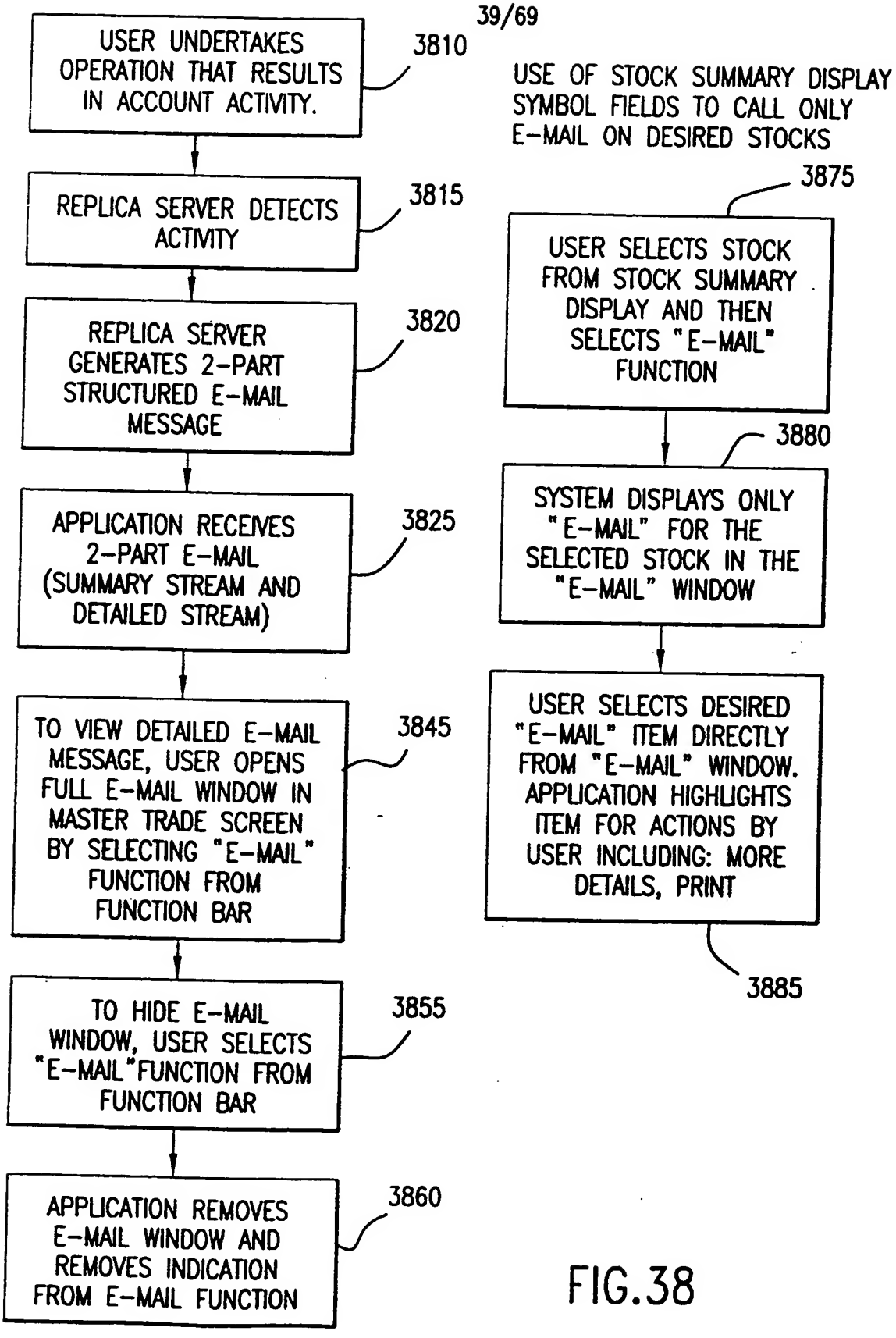

USER UNDERTAKES OPERATION THAT RESULTS IN ACCOUNT ACTIVITY.
3810
REPLICA SERVER DETECTS ACTIVITY
3815
REPLICA SERVER GENERATES 2-PART STRUCTURED E-MAIL MESSAGE
3820
APPLICATION RECEIVES 2-PART E-MAIL (SUMMARY STREAM AND DETAILED STREAM)
3825
TO VIEW DETAILED E-MAIL MESSAGE, USER OPENS FULL E-MAIL WINDOW IN MASTER TRADE SCREEN BY SELECTING "E-MAIL" FUNCTION FROM FUNCTION BAR
3845
TO HIDE E-MAIL WINDOW, USER SELECTS "E-MAIL" FUNCTION FROM FUNCTION BAR
3855
APPLICATION REMOVES E-MAIL WINDOW AND REMOVES INDICATION FROM E-MAIL FUNCTION
3860
USE OF STOCK SUMMARY DISPLAY SYMBOL FIELDS TO CALL ONLY E-MAIL ON DESIRED STOCKS
3875
USER SELECTS STOCK FROM STOCK SUMMARY DISPLAY AND THEN SELECTS "E-MAIL" FUNCTION
3880
SYSTEM DISPLAYS ONLY "E-MAIL" FOR THE SELECTED STOCK IN THE "E-MAIL" WINDOW
USER SELECTS DESIRED "E-MAIL" ITEM DIRECTLY FROM "E-MAIL" WINDOW. APPLICATION HIGHLIGHTS ITEM FOR ACTIONS BY USER INCLUDING: MORE DETAILS, PRINT
3885

FIG.38

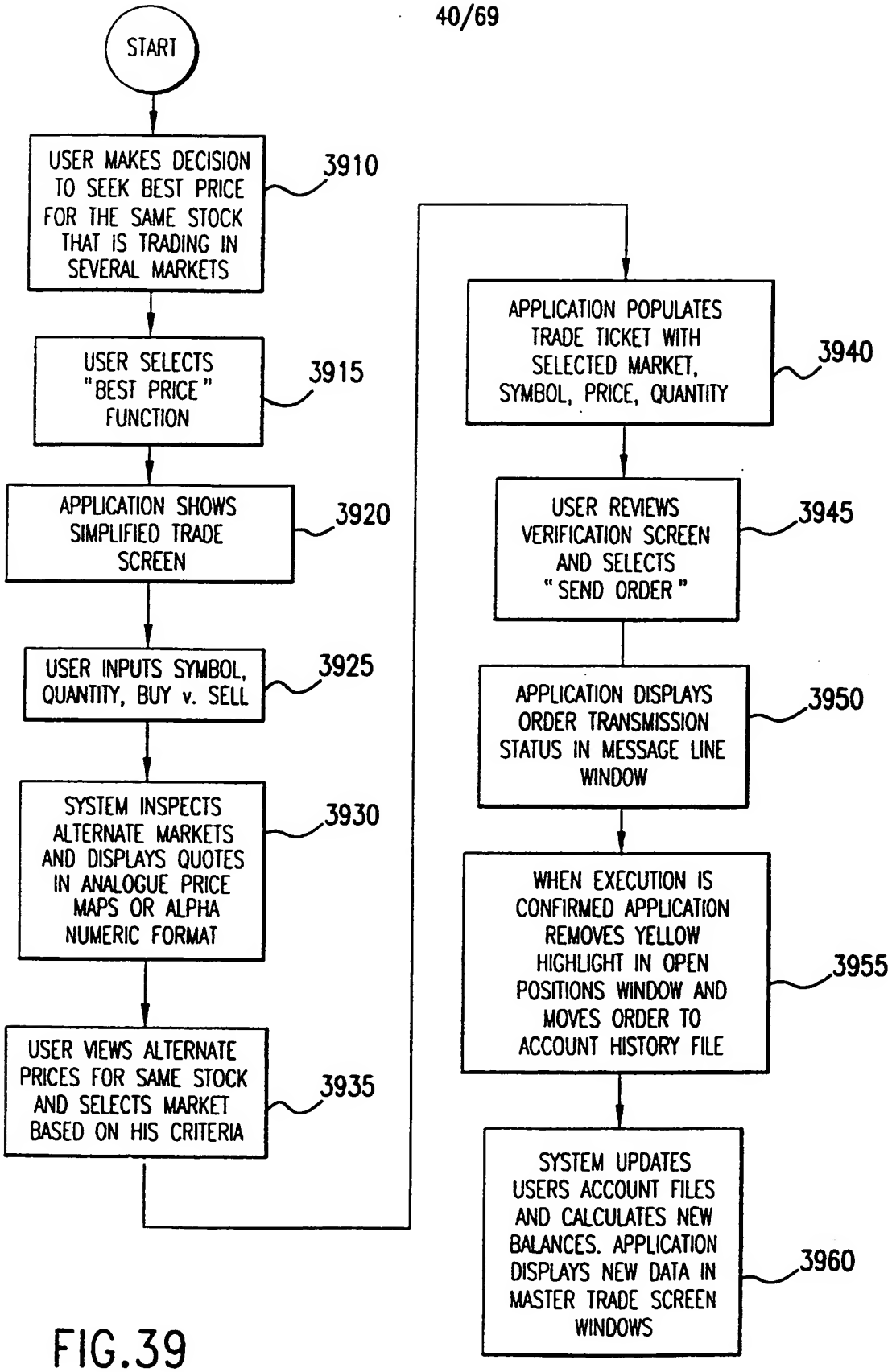

START
USER MAKES DECISION TO SEEK BEST PRICE FOR THE SAME STOCK THAT IS TRADING IN SEVERAL MARKETS
3910
USER SELECTS "BEST PRICE" FUNCTION
3915
APPLICATION SHOWS SIMPLIFIED TRADE SCREEN
3920
USER INPUTS SYMBOL, QUANTITY, BUY v. SELL
3925
SYSTEM INSPECTS ALTERNATE MARKETS AND DISPLAYS QUOTES IN ANALOGUE PRICE MAPS OR ALPHA NUMERIC FORMAT
3930
USER VIEWS ALTERNATE PRICES FOR SAME STOCK AND SELECTS MARKET BASED ON HIS CRITERIA
3935
APPLICATION POPULATES TRADE TICKET WITH SELECTED MARKET, SYMBOL, PRICE, QUANTITY
3940
USER REVIEWS VERIFICATION SCREEN AND SELECTS "SEND ORDER"
3945
APPLICATION DISPLAYS ORDER TRANSMISSION STATUS IN MESSAGE LINE WINDOW
3950
WHEN EXECUTION IS CONFIRMED APPLICATION REMOVES YELLOW HIGHLIGHT IN OPEN POSITIONS WINDOW AND MOVES ORDER TO ACCOUNT HISTORY FILE
3955
SYSTEM UPDATES USERS ACCOUNT FILES AND CALCULATES NEW BALANCES. APPLICATION DISPLAYS NEW DATA IN MASTER TRADE SCREEN WINDOWS
3960

FIG.39

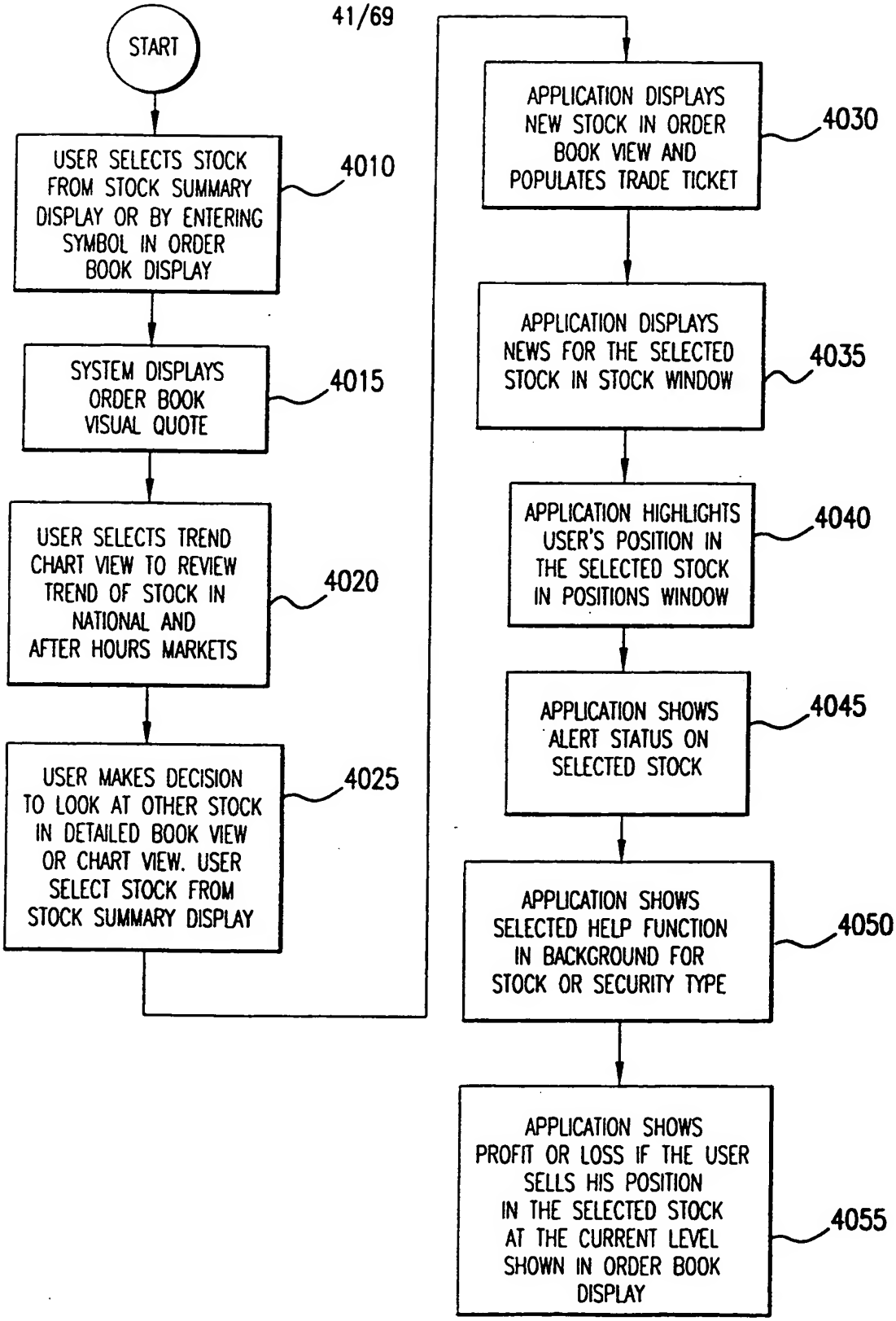

START
USER SELECTS STOCK FROM STOCK SUMMARY DISPLAY OR BY ENTERING SYMBOL IN ORDER BOOK DISPLAY
4010
SYSTEM DISPLAYS ORDER BOOK VISUAL QUOTE
4015
USER SELECTS TREND CHART VIEW TO REVIEW TREND OF STOCK IN NATIONAL AND AFTER HOURS MARKETS
4020
USER MAKES DECISION TO LOOK AT OTHER STOCK IN DETAILED BOOK VIEW OR CHART VIEW. USER SELECT STOCK FROM STOCK SUMMARY DISPLAY
4025
APPLICATION DISPLAYS NEW STOCK IN ORDER BOOK VIEW AND POPULATES TRADE TICKET
4030
APPLICATION DISPLAYS NEWS FOR THE SELECTED STOCK IN STOCK WINDOW
4035
APPLICATION HIGHLIGHTS USER'S POSITION IN THE SELECTED STOCK IN POSITIONS WINDOW
4040
APPLICATION SHOWS ALERT STATUS ON SELECTED STOCK
4045
APPLICATION SHOWS SELECTED HELP FUNCTION IN BACKGROUND FOR STOCK OR SECURITY TYPE
4050
APPLICATION SHOWS PROFIT OR LOSS IF THE USER SELLS HIS POSITION IN THE SELECTED STOCK AT THE CURRENT LEVEL SHOWN IN ORDER BOOK DISPLAY
4055

FIG.40

WEST

NEGOTIATION DEFAULT SETUP SCREEN

ENTER THE DEFAULT VALUES FOR LIMITING NEGOTIATIONS FROM OTHER TRADERS

PLEASE NOTE THAT THE VALUES YOU ENTER IN THE DEFAULT SETTINGS WILL HAVE A SIGNIFICANT EFFECT ON THE INCOMING ORDERS YOU RECEIVE FROM OTHER TRADERS. THE VALUES YOU ENTER ARE DEFAULTS WHICH CAN BE OVERRIDDEN AT ANY TIME BY SIMPLY TYPING OVER THE DEFAULTS IN THE NEGOTIATIONS SCREEN.

1 WHAT PRICE ABOVE AND BELOW YOUR LIMIT PRICE ARE YOU WILLING TO NEGOTIATE? 4105
ENTER PRICE INCREMENT HERE IN 1/16 [0.25]

2 WHAT # OF SHARES BELOW AND ABOVE YOUR ORDER SIZE ARE YOU WILLING TO NEGOTIATE?
ENTER NUMBER OF SHARES HERE [100] 4110

3 WHAT WILL BE YOUR DEFAULT PREFERRED NEGOTIATION TIME? 4115
ENTER DESIRED INCREMENT HERE [10 MIN.]

4 WHAT WILL BE THE LOWER TIME LIMIT YOU WILL ACCEPT? 4120
ENTER MINUTE INCREMENT HERE [2 MIN.]

SETTING THE DEFAULTS FOR EACH TIME YOU CLICK THE ADJUSTMENT BUTTONS

5 WHAT WILL THE INCREMENT BE FOR EACH CLICK OF SIZE CHANGE BUTTONS? 4125
ENTER SIZE INCREMENTS HERE [100 SHARES]

6 WHAT WILL THE INCREMENT BE FOR EACH CLICK OF TIME CHANGE BUTTONS? 4130
ENTER SIZE INCREMENT HERE [1 MIN.]

7 WHAT WILL THE INCREMENT BE FOR EACH CLICK OF PRICE CHANGE BUTTONS? 4135
ENTER SIZE INCREMENT HERE [0.0625]

8 ON LIMIT ORDERS THAT YOU ENTER, DO YOU WANT TO HAVE THE SYSTEM ALLOW NEGOTIATIONS AS YOUR DEFAULT SETTINGS/ oYES OR oNO

SEE ON-LINE HELP (FOR DETAILS CLICK HERE)

FIG.41

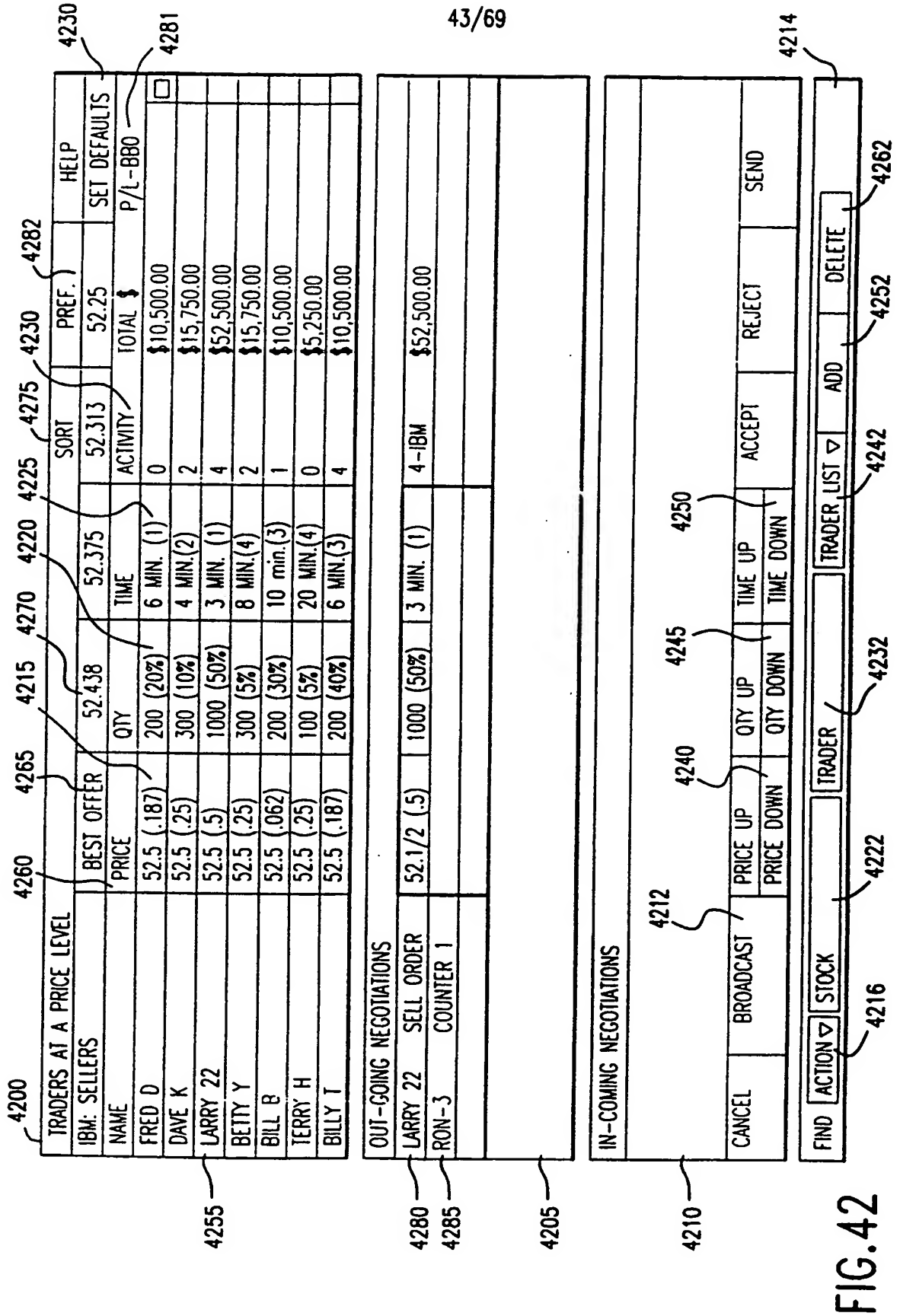

4200
TRADERS AT A PRICE LEVEL
IBM: SELLERS
BEST OFFER
52.438
52.375
52.313
52.25
SET DEFAULTS
NAME
PRICE
QTY
TIME
ACTIVITY
TOTAL $
P/L-BBO
FRED D
52.5 (.187)
200 (20%)
6 MIN. (1)
0
$10,500.00
DAVE K
52.5 (.25)
300 (10%)
4 MIN.(2)
2
$15,750.00
LARRY 22
52.5 (.5)
1000 (50%)
3 MIN. (1)
4
$52,500.00
BETTY Y
52.5 (.25)
300 (5%)
8 MIN.(4)
2
$15,750.00
BILL B
52.5 (.062)
200 (30%)
10 min.(3)
1
$10,500.00
TERRY H
52.5 (.25)
100 (5%)
20 MIN.(4)
0
$5,250.00
BILLY T
52.5 (.187)
200 (40%)
6 MIN.(3)
4
$10,500.00
4255
OUT-GOING NEGOTIATIONS
LARRY 22 SELL ORDER
52.1/2 (.5)
1000 (50%)
3 MIN. (1)
4-IBM
$52,500.00
RON-3 COUNTER 1
4280
4285
4205
IN-COMING NEGOTIATIONS
4210
CANCEL
BROADCAST
PRICE UP
PRICE DOWN
QTY UP
QTY DOWN
TIME UP
TIME DOWN
ACCEPT
REJECT
SEND
FIND
ACTION
STOCK
TRADER
TRADER LIST
ADD
DELETE
4212
4222
4216
4240
4232
4245
4250
4242
4252
4262
4214
4230
4281
4282
4275
4225
4220
4270
4215
4265
4260

FIG.42

WEST

VISUAL QUOTE AND ORDER BOOK DISPLAY			NITE MKT IS OPEN				PREF.	HELP
IBM INTERNATIONAL BUSINESS MACHINES							S	MORE INFO.
BUY SIDE			PRICE IN 1/16		SELL SIDE		55	DAY / NITE
YOUR ORDERS	AON QTY.	LIMIT QTY.	DECIMALS	LIMIT QTY.	AON QTY.	YOUR ORDERS		
			53	100	500			
			52.9375	500	1000	300	54	
			52.876	400	500			
			52.8125	400	500	200		
			52.75	150	150		53	
			52.6875	1000	1000	100		
			52.625	4500	1000			
			52.582	5000	2500		52	
			52.5	2300	3000			
			52.4375	3000	10000			
			52.375	2571	8000		51	
			52.3125	8000	25000			
			52.25	1284				
			52.1875	6000			50	
			52.125					
			52.0625					
	1000	200	52				YOUR POS. $ 39.00	
VOL	HI	LOW	LAST NITE	CHNG.NITE	LAST DAY	CHNG.DAY	P&L $4,508	
980.000	$52.75	$50.0625	52.1875	2.25%	$51.0625	1.50%	OVERALL P&L 19%	
ORDER BK.	CHART	MOST ACTIVE	SHOW NEWS	NEWS OUT	DAY MKT	NITE MKT	PRICE MAP SCALE	
TO SHOW NEW STOCK ENTER SYMBOL>>			SYMBOL	MOVEMENT UP	COMPRESS SPREAD			

TRADE TICKET			PREF.	✕
ACTION	QUANTITY	SYMBOL	PRICE TYPE	
BUY ▽	500 ▽	IBM ▽	LIMIT ▽	
LIMIT PRICE	STOP PRICE	ACCT. 93901031	☐ NEGOTIATIONS ALLOWED	
52 ▽	▽		☐ ANONYMOUS	
DURATION	CONDITION	ACCOUNT	ROUTE TO	
DAY ▽	NONE ▽	CASH ▽	NITE ▽	
REAL-TIME QUOTE SHOWN BELOW				
OPEN	HI	LAST	CHANGE	
CLOSE	LOW	VOL		
BID:0.0	BID SIZE: 0.0	ASK: 0.0	ASK SIZE: 0.0	
YOUR CURRENT BUYING POWER IS:			$64,000	
IF YOU EXECUTE THIS TRADE YOUR BALANCE WILL BE			$23,150	
THE TOTAL COST INCLUDING COMMISSION WILL BE			$41,950.00	
VERIFICATION	SHOW DSM	CANCEL		
	CLEAR	HIDE DETAILS		

WIT CAPITAL ON LINE	WELCOME TO THE NEW WIT CAPITAL DIGITAL STOCK MARKET		
	IBM +2.25%, 52.187		
WIT			
WATCH STKS.			
YOUR STKS.			

TRADE STOCKS	POS./P&L	ACCOUNT HISTORY	FUNDS AVAILABLE
QUICK QUOTE	OPEN ORDERS	NEGOTIATIONS	MESSAGES

FIG.43A

WEST

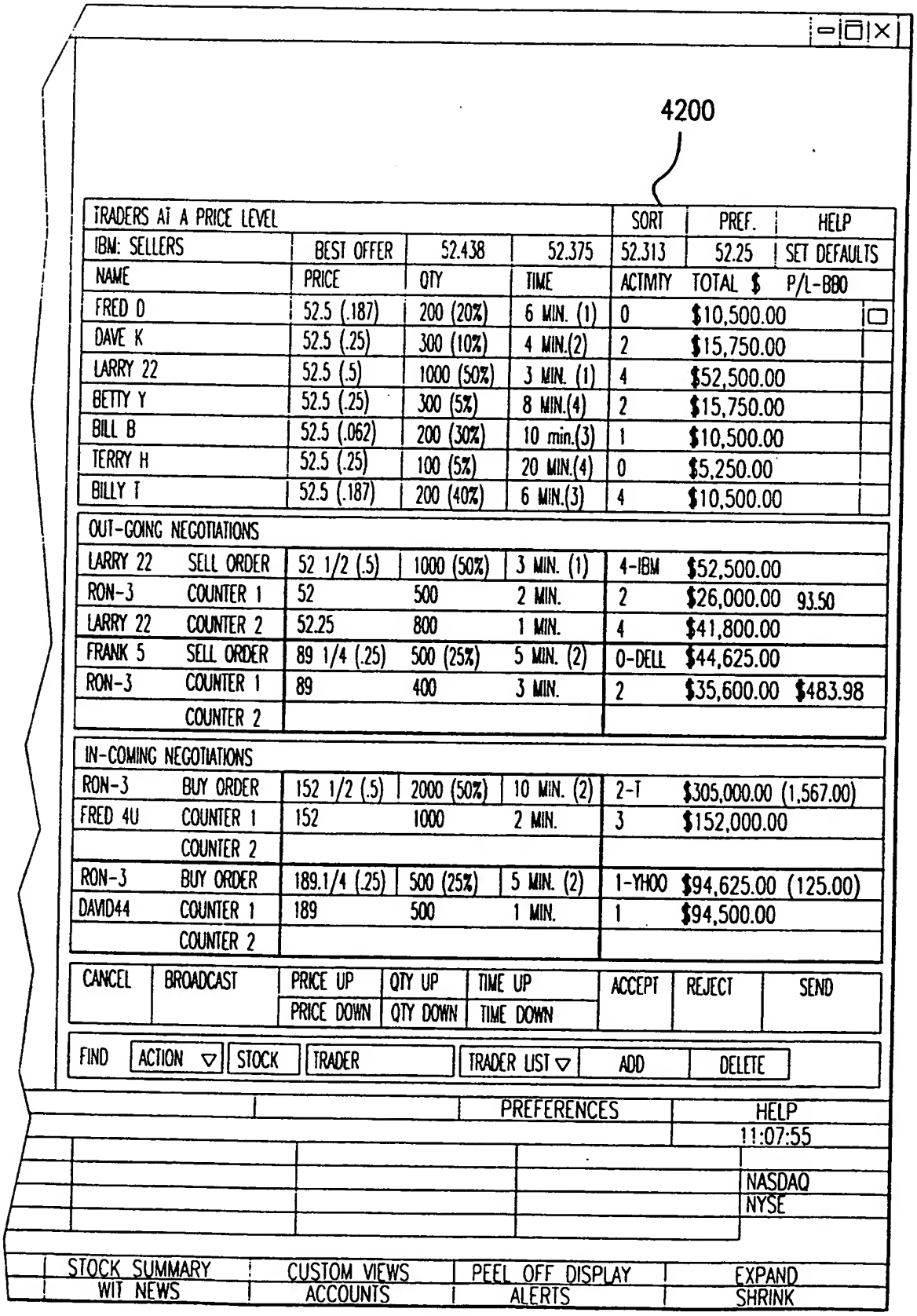

4200
TRADERS AT A PRICE LEVEL
SORT
PREF.
HELP
IBM: SELLERS
BEST OFFER
52.438
52.375
52.313
52.25
SET DEFAULTS
NAME
PRICE
QTY
TIME
ACTIVITY
TOTAL $
P/L-BBO
FRED D 52.5 (.187) 200 (20%) 6 MIN. (1) 0 $10,500.00
DAVE K 52.5 (.25) 300 (10%) 4 MIN.(2) 2 $15,750.00
LARRY 22 52.5 (.5) 1000 (50%) 3 MIN. (1) 4 $52,500.00
BETTY Y 52.5 (.25) 300 (5%) 8 MIN.(4) 2 $15,750.00
BILL B 52.5 (.062) 200 (30%) 10 min.(3) 1 $10,500.00
TERRY H 52.5 (.25) 100 (5%) 20 MIN.(4) 0 $5,250.00
BILLY T 52.5 (.187) 200 (40%) 6 MIN.(3) 4 $10,500.00
OUT-GOING NEGOTIATIONS
LARRY 22 SELL ORDER 52 1/2 (.5) 1000 (50%) 3 MIN. (1) 4-IBM $52,500.00
RON-3 COUNTER 1 52 500 2 MIN. 2 $26,000.00 93.50
LARRY 22 COUNTER 2 52.25 800 1 MIN. 4 $41,800.00
FRANK 5 SELL ORDER 89 1/4 (.25) 500 (25%) 5 MIN. (2) 0-DELL $44,625.00
RON-3 COUNTER 1 89 400 3 MIN. 2 $35,600.00 $483.98
COUNTER 2
IN-COMING NEGOTIATIONS
RON-3 BUY ORDER 152 1/2 (.5) 2000 (50%) 10 MIN. (2) 2-T $305,000.00 (1,567.00)
FRED 4U COUNTER 1 152 1000 2 MIN. 3 $152,000.00
COUNTER 2
RON-3 BUY ORDER 189.1/4 (.25) 500 (25%) 5 MIN. (2) 1-YHOO $94,625.00 (125.00)
DAVID44 COUNTER 1 189 500 1 MIN. 1 $94,500.00
COUNTER 2
CANCEL
BROADCAST
PRICE UP
PRICE DOWN
QTY UP
QTY DOWN
TIME UP
TIME DOWN
ACCEPT
REJECT
SEND
FIND
ACTION
STOCK
TRADER
TRADER LIST
ADD
DELETE
PREFERENCES
HELP
11:07:55
NASDAQ
NYSE
STOCK SUMMARY
WIT NEWS
CUSTOM VIEWS
ACCOUNTS
PEEL OFF DISPLAY
ALERTS
EXPAND
SHRINK

FIG.43B

WEST

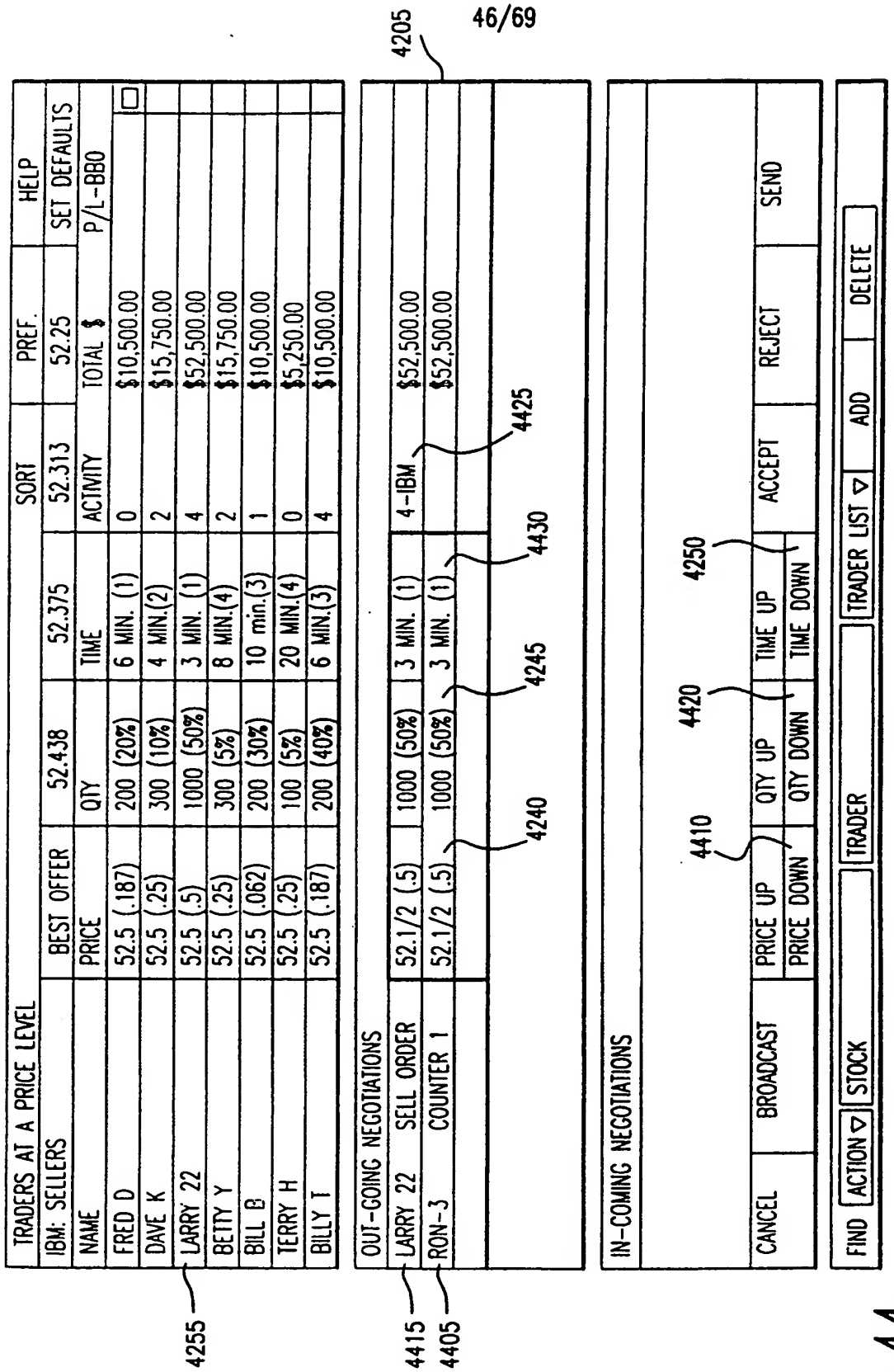

TRADERS AT A PRICE LEVEL
SORT
PREF.
HELP
IBM: SELLERS
BEST OFFER
52.438
52.375
52.313
52.25
SET DEFAULTS
NAME
PRICE
QTY
TIME
ACTIVITY
TOTAL $
P/L-BBO
FRED D
52.5 (.187)
200 (20%)
6 MIN. (1)
0
$10,500.00
DAVE K
52.5 (.25)
300 (10%)
4 MIN.(2)
2
$15,750.00
LARRY 22
52.5 (.5)
1000 (50%)
3 MIN. (1)
4
$52,500.00
BETTY Y
52.5 (.25)
300 (5%)
8 MIN.(4)
2
$15,750.00
BILL B
52.5 (.062)
200 (30%)
10 min.(3)
1
$10,500.00
TERRY H
52.5 (.25)
100 (5%)
20 MIN.(4)
0
$5,250.00
BILLY T
52.5 (.187)
200 (40%)
6 MIN.(3)
4
$10,500.00
4255
4205
OUT-GOING NEGOTIATIONS
LARRY 22 SELL ORDER
52.1/2 (.5)
1000 (50%)
3 MIN. (1)
4-IBM
$52,500.00
RON-3 COUNTER 1
52.1/2 (.5)
1000 (50%)
3 MIN. (1)
$52,500.00
4415
4405
4240
4245
4430
4425
IN-COMING NEGOTIATIONS
CANCEL
BROADCAST
PRICE UP
PRICE DOWN
QTY UP
QTY DOWN
TIME UP
TIME DOWN
ACCEPT
REJECT
SEND
4410
4420
4250
FIND
ACTION
STOCK
TRADER
TRADER LIST
ADD
DELETE

FIG. 44

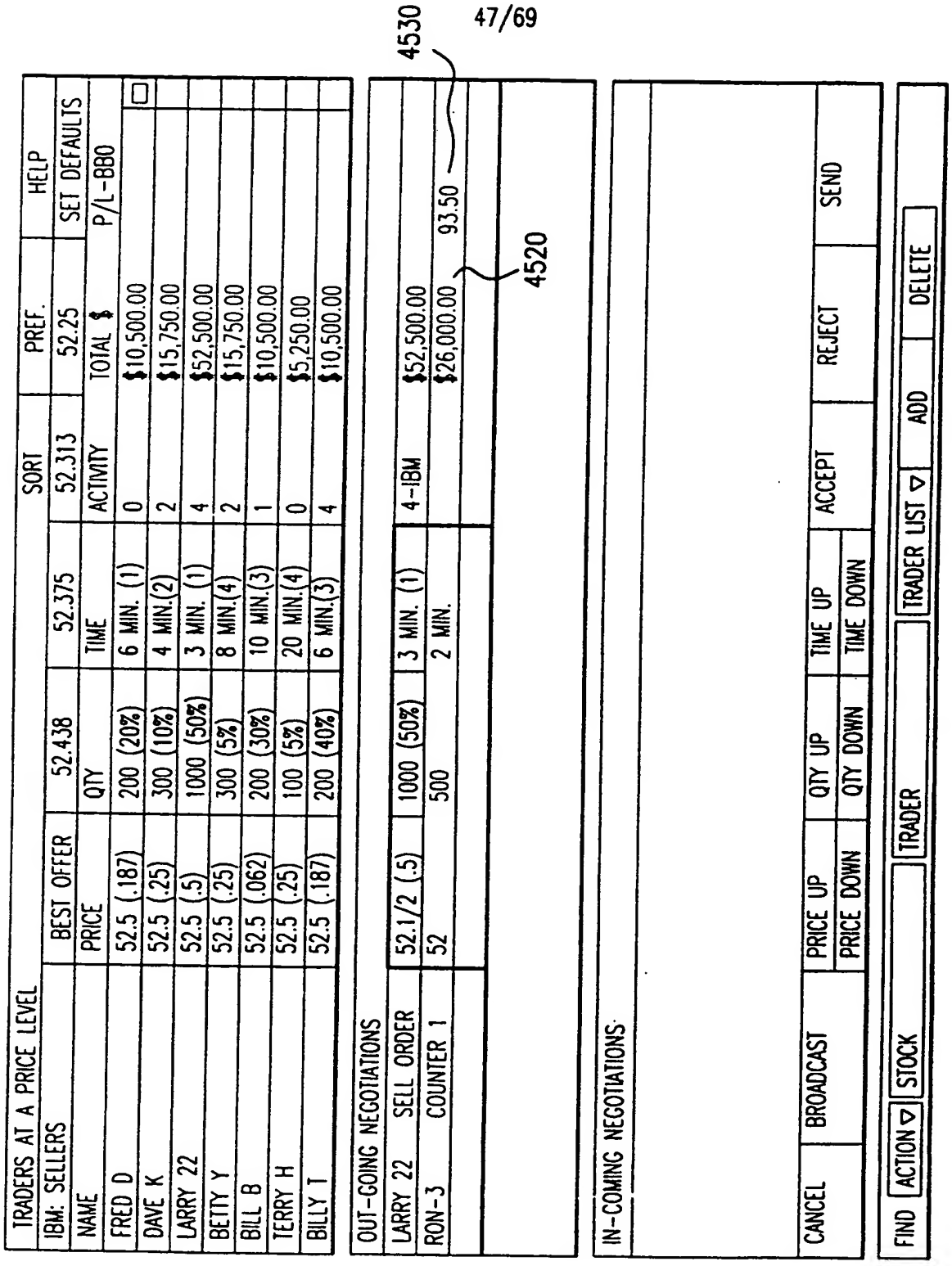

4530
4520
TRADERS AT A PRICE LEVEL
SORT
PREF.
HELP
IBM: SELLERS
BEST OFFER
52.438
52.375
52.313
52.25
SET DEFAULTS
NAME
PRICE
QTY
TIME
ACTIVITY
TOTAL $
P/L-BBO
FRED D
52.5 (.187)
200 (20%)
6 MIN. (1)
0
$10,500.00
DAVE K
52.5 (.25)
300 (10%)
4 MIN.(2)
2
$15,750.00
LARRY 22
52.5 (.5)
1000 (50%)
3 MIN. (1)
4
$52,500.00
BETTY Y
52.5 (.25)
300 (5%)
8 MIN.(4)
2
$15,750.00
BILL B
52.5 (.062)
200 (30%)
10 MIN.(3)
1
$10,500.00
TERRY H
52.5 (.25)
100 (5%)
20 MIN.(4)
0
$5,250.00
BILLY T
52.5 (.187)
200 (40%)
6 MIN.(3)
4
$10,500.00
OUT-GOING NEGOTIATIONS
LARRY 22 SELL ORDER
52.1/2 (.5)
1000 (50%)
3 MIN. (1)
4-IBM
$52,500.00
RON-3 COUNTER 1
52
500
2 MIN.
$26,000.00
93.50
IN-COMING NEGOTIATIONS
CANCEL
BROADCAST
PRICE UP
PRICE DOWN
QTY UP
QTY DOWN
TIME UP
TIME DOWN
ACCEPT
REJECT
SEND
FIND
ACTION
STOCK
TRADER
TRADER LIST
ADD
DELETE

FIG.45

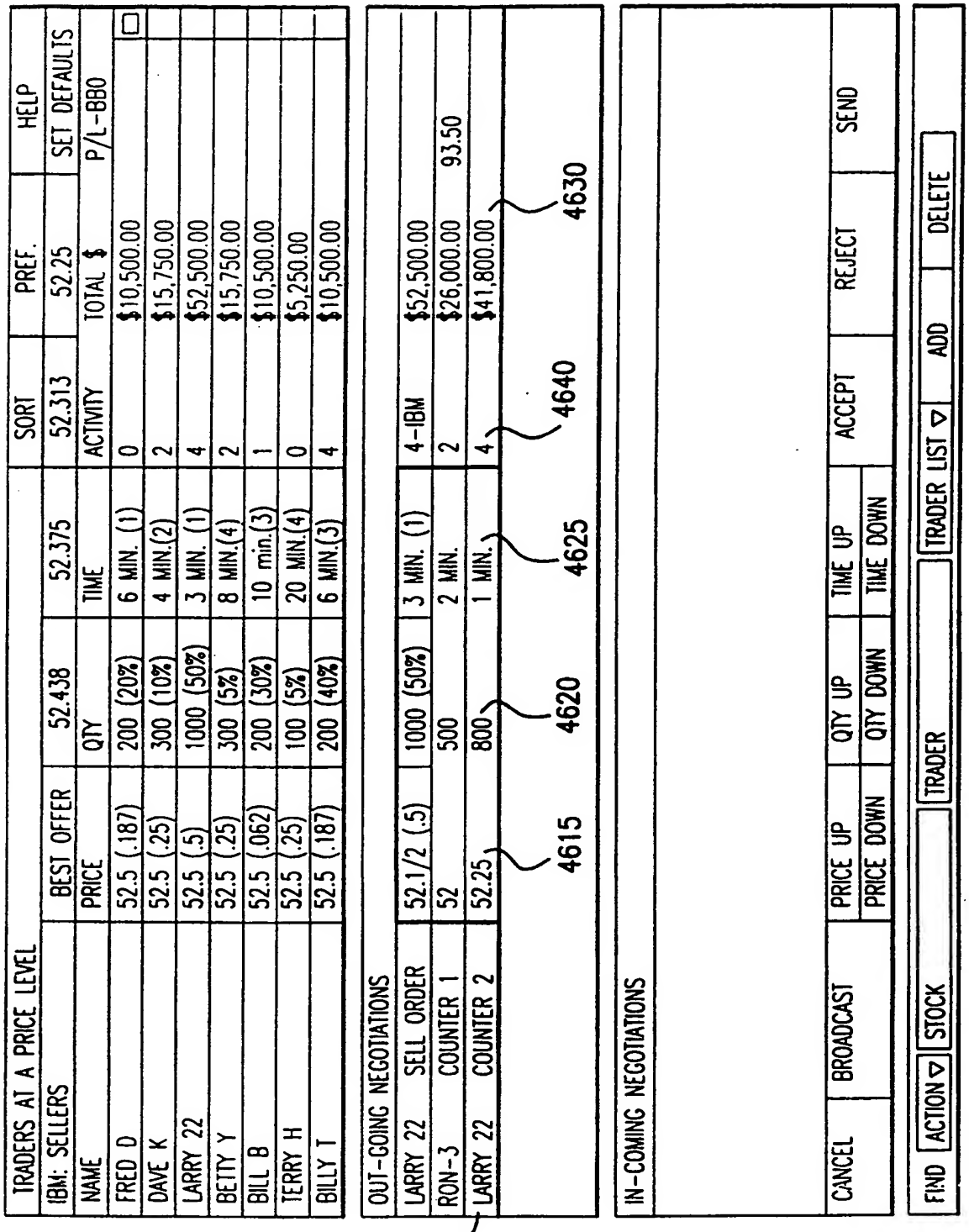

TRADERS AT A PRICE LEVEL
SORT
PREF.
HELP
IBM: SELLERS
BEST OFFER
52.438
52.375
52.313
52.25
SET DEFAULTS
NAME
PRICE
QTY
TIME
ACTIVITY
TOTAL $
P/L-BBO
FRED D
52.5 (.187)
200 (20%)
6 MIN. (1)
0
$10,500.00
DAVE K
52.5 (.25)
300 (10%)
4 MIN.(2)
2
$15,750.00
LARRY 22
52.5 (.5)
1000 (50%)
3 MIN. (1)
4
$52,500.00
BETTY Y
52.5 (.25)
300 (5%)
8 MIN.(4)
2
$15,750.00
BILL B
52.5 (.062)
200 (30%)
10 min.(3)
1
$10,500.00
TERRY H
52.5 (.25)
100 (5%)
20 MIN.(4)
0
$5,250.00
BILLY T
52.5 (.187)
200 (40%)
6 MIN.(3)
4
$10,500.00
OUT-GOING NEGOTIATIONS
LARRY 22 SELL ORDER
52.1/2 (.5)
1000 (50%)
3 MIN. (1)
4-IBM
$52,500.00
RON-3 COUNTER 1
52
500
2 MIN.
2
$26,000.00
93.50
LARRY 22 COUNTER 2
52.25
800
1 MIN.
4
$41,800.00
4610
4615
4620
4625
4630
4640
IN-COMING NEGOTIATIONS
CANCEL
BROADCAST
PRICE UP
PRICE DOWN
QTY UP
QTY DOWN
TRADER
TIME UP
TIME DOWN
ACCEPT
REJECT
SEND
FIND
ACTION
STOCK
TRADER LIST
ADD
DELETE

FIG.46

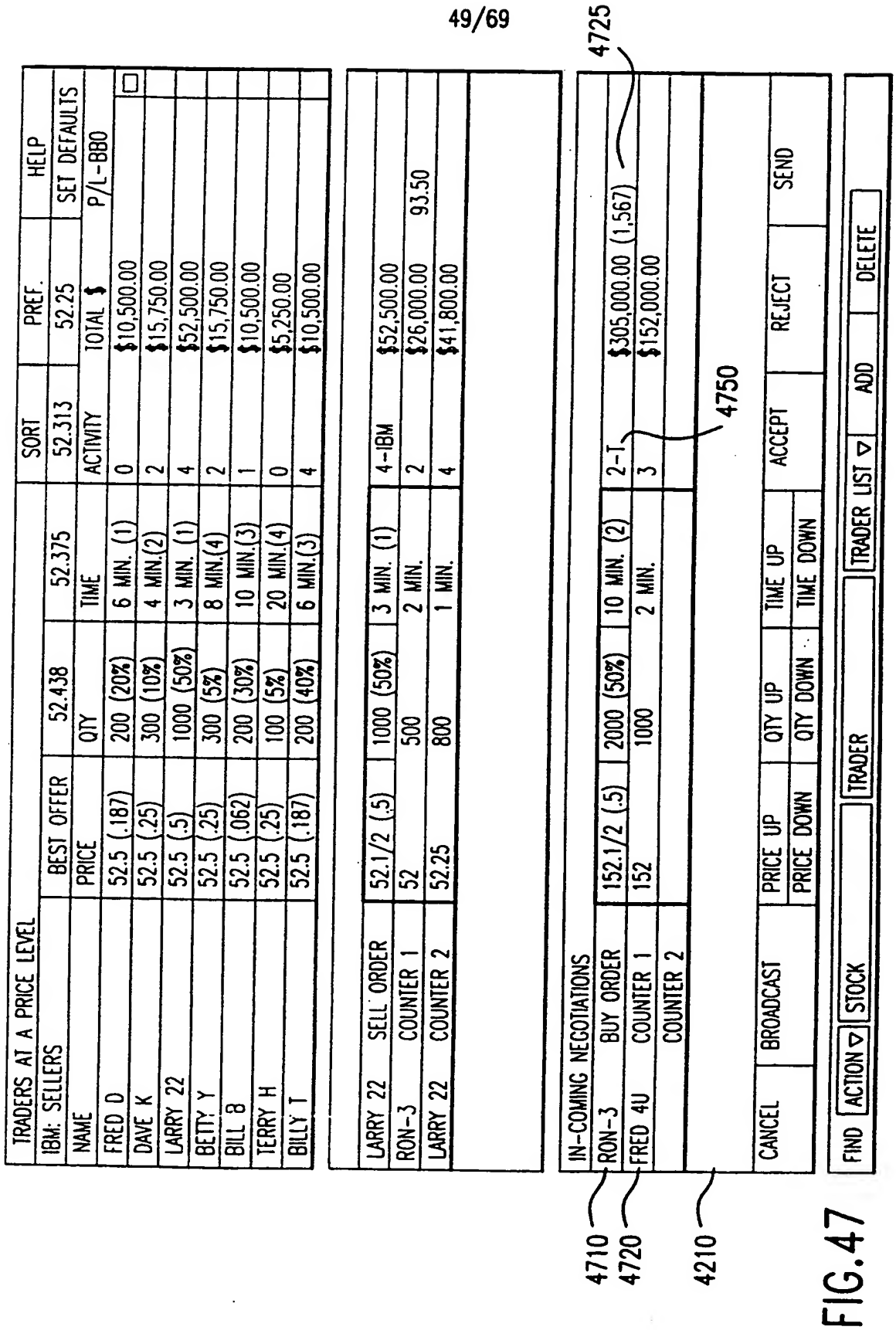

TRADERS AT A PRICE LEVEL
IBM: SELLERS
BEST OFFER
52.438
52.375
SORT
52.313
PREF.
52.25
HELP
SET DEFAULTS
NAME
PRICE
QTY
TIME
ACTIVITY
TOTAL $
P/L-BBO
FRED D
52.5 (.187)
200 (20%)
6 MIN. (1)
0
$10,500.00
DAVE K
52.5 (.25)
300 (10%)
4 MIN.(2)
2
$15,750.00
LARRY 22
52.5 (.5)
1000 (50%)
3 MIN. (1)
4
$52,500.00
BETTY Y
52.5 (.25)
300 (5%)
8 MIN.(4)
2
$15,750.00
BILL B
52.5 (.062)
200 (30%)
10 MIN.(3)
1
$10,500.00
TERRY H
52.5 (.25)
100 (5%)
20 MIN.(4)
0
$5,250.00
BILLY T
52.5 (.187)
200 (40%)
6 MIN.(3)
4
$10,500.00
LARRY 22 SELL ORDER 52.1/2 (.5) 1000 (50%) 3 MIN. (1) 4-IBM $52,500.00
RON-3 COUNTER 1 52 500 2 MIN. 2 $26,000.00 93.50
LARRY 22 COUNTER 2 52.25 800 1 MIN. 4 $41,800.00
IN-COMING NEGOTIATIONS
RON-3 BUY ORDER 152.1/2 (.5) 2000 (50%) 10 MIN. (2) 2-I $305,000.00 (1,567)
FRED 4U COUNTER 1 152 1000 2 MIN. 3 $152,000.00
COUNTER 2
CANCEL
BROADCAST
PRICE UP
PRICE DOWN
QTY UP
QTY DOWN
TIME UP
TIME DOWN
ACCEPT
REJECT
SEND
FIND
ACTION
STOCK
TRADER
TRADER LIST
ADD
DELETE
4725
4750
4710
4720
4210

FIG.47

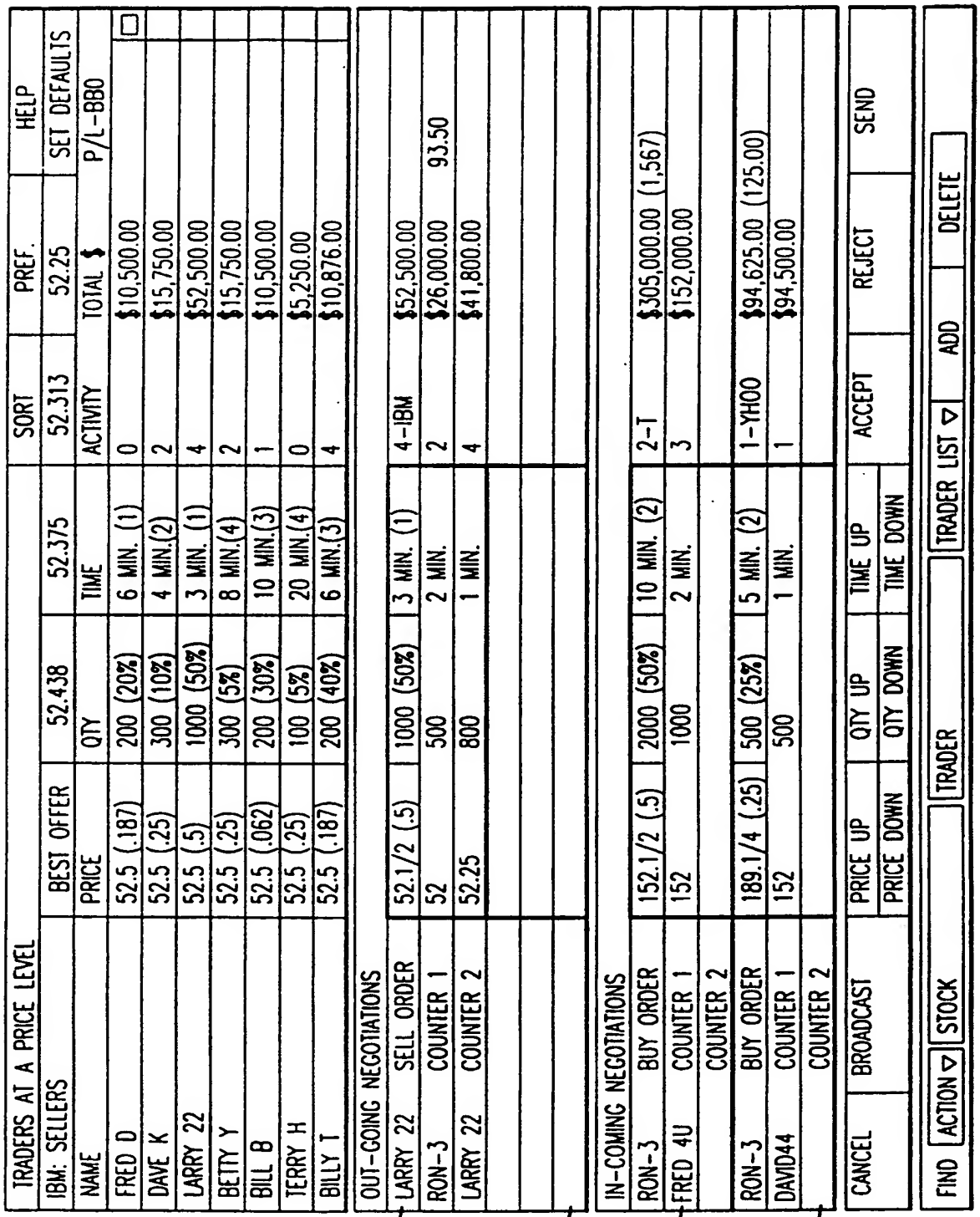

TRADERS AT A PRICE LEVEL
SORT
PREF.
HELP
IBM: SELLERS
BEST OFFER
52.438
52.375
52.313
52.25
SET DEFAULTS
NAME
PRICE
QTY
TIME
ACTIVITY
TOTAL $
P/L-BBO
FRED D 52.5 (.187) 200 (20%) 6 MIN. (1) 0 $10,500.00
DAVE K 52.5 (.25) 300 (10%) 4 MIN.(2) 2 $15,750.00
LARRY 22 52.5 (.5) 1000 (50%) 3 MIN. (1) 4 $52,500.00
BETTY Y 52.5 (.25) 300 (5%) 8 MIN.(4) 2 $15,750.00
BILL B 52.5 (.062) 200 (30%) 10 MIN.(3) 1 $10,500.00
TERRY H 52.5 (.25) 100 (5%) 20 MIN.(4) 0 $5,250.00
BILLY T 52.5 (.187) 200 (40%) 6 MIN.(3) 4 $10,876.00
OUT-GOING NEGOTIATIONS
LARRY 22 SELL ORDER 52.1/2 (.5) 1000 (50%) 3 MIN. (1) 4-IBM $52,500.00
RON-3 COUNTER 1 52 500 2 MIN. 2 $26,000.00 93.50
LARRY 22 COUNTER 2 52.25 800 1 MIN. 4 $41,800.00
IN-COMING NEGOTIATIONS
RON-3 BUY ORDER 152.1/2 (.5) 2000 (50%) 10 MIN. (2) 2-T $305,000.00 (1,567)
FRED 4U COUNTER 1 152 1000 2 MIN. 3 $152,000.00
COUNTER 2
RON-3 BUY ORDER 189.1/4 (.25) 500 (25%) 5 MIN. (2) 1-YHOO $94,625.00 (125.00)
DAVID44 COUNTER 1 152 500 1 MIN. 1 $94,500.00
COUNTER 2
CANCEL
BROADCAST
PRICE UP
PRICE DOWN
QTY UP
QTY DOWN
TIME UP
TIME DOWN
ACCEPT
REJECT
SEND
FIND
ACTION
STOCK
TRADER
TRADER LIST
ADD
DELETE
4810
4820
4830
4840

FIG. 48

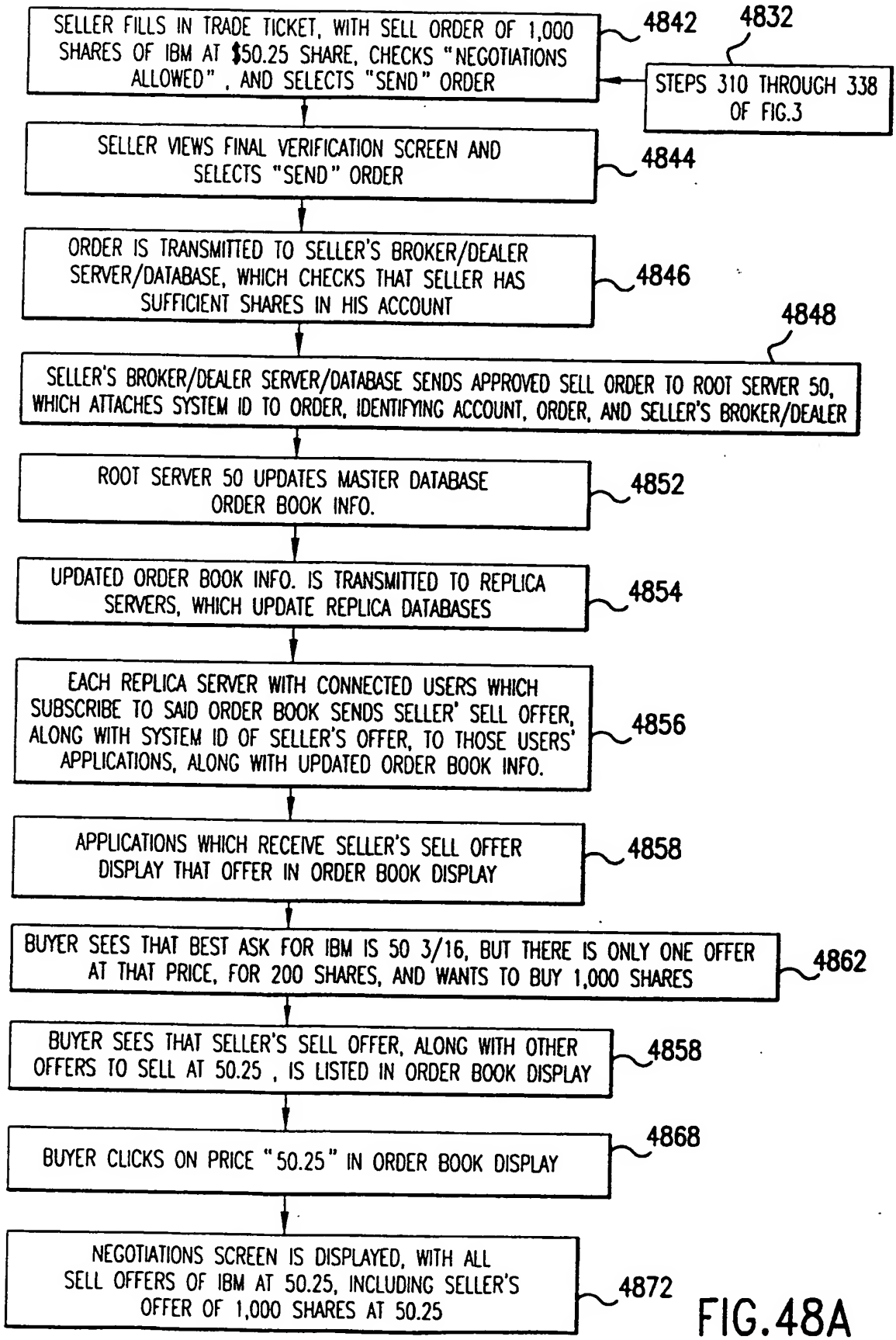

SELLER FILLS IN TRADE TICKET, WITH SELL ORDER OF 1,000 SHARES OF IBM AT $50.25 SHARE, CHECKS "NEGOTIATIONS ALLOWED", AND SELECTS "SEND" ORDER
4842
4832
STEPS 310 THROUGH 338 OF FIG.3
SELLER VIEWS FINAL VERIFICATION SCREEN AND SELECTS "SEND" ORDER
4844
ORDER IS TRANSMITTED TO SELLER'S BROKER/DEALER SERVER/DATABASE, WHICH CHECKS THAT SELLER HAS SUFFICIENT SHARES IN HIS ACCOUNT
4846
4848
SELLER'S BROKER/DEALER SERVER/DATABASE SENDS APPROVED SELL ORDER TO ROOT SERVER 50, WHICH ATTACHES SYSTEM ID TO ORDER, IDENTIFYING ACCOUNT, ORDER, AND SELLER'S BROKER/DEALER
ROOT SERVER 50 UPDATES MASTER DATABASE ORDER BOOK INFO.
4852
UPDATED ORDER BOOK INFO. IS TRANSMITTED TO REPLICA SERVERS, WHICH UPDATE REPLICA DATABASES
4854
EACH REPLICA SERVER WITH CONNECTED USERS WHICH SUBSCRIBE TO SAID ORDER BOOK SENDS SELLER' SELL OFFER, ALONG WITH SYSTEM ID OF SELLER'S OFFER, TO THOSE USERS' APPLICATIONS, ALONG WITH UPDATED ORDER BOOK INFO.
4856
APPLICATIONS WHICH RECEIVE SELLER'S SELL OFFER DISPLAY THAT OFFER IN ORDER BOOK DISPLAY
4858
BUYER SEES THAT BEST ASK FOR IBM IS 50 3/16, BUT THERE IS ONLY ONE OFFER AT THAT PRICE, FOR 200 SHARES, AND WANTS TO BUY 1,000 SHARES
4862
BUYER SEES THAT SELLER'S SELL OFFER, ALONG WITH OTHER OFFERS TO SELL AT 50.25 , IS LISTED IN ORDER BOOK DISPLAY
4858
BUYER CLICKS ON PRICE "50.25" IN ORDER BOOK DISPLAY
4868
NEGOTIATIONS SCREEN IS DISPLAYED, WITH ALL SELL OFFERS OF IBM AT 50.25, INCLUDING SELLER'S OFFER OF 1,000 SHARES AT 50.25
4872

FIG.48A

WEST

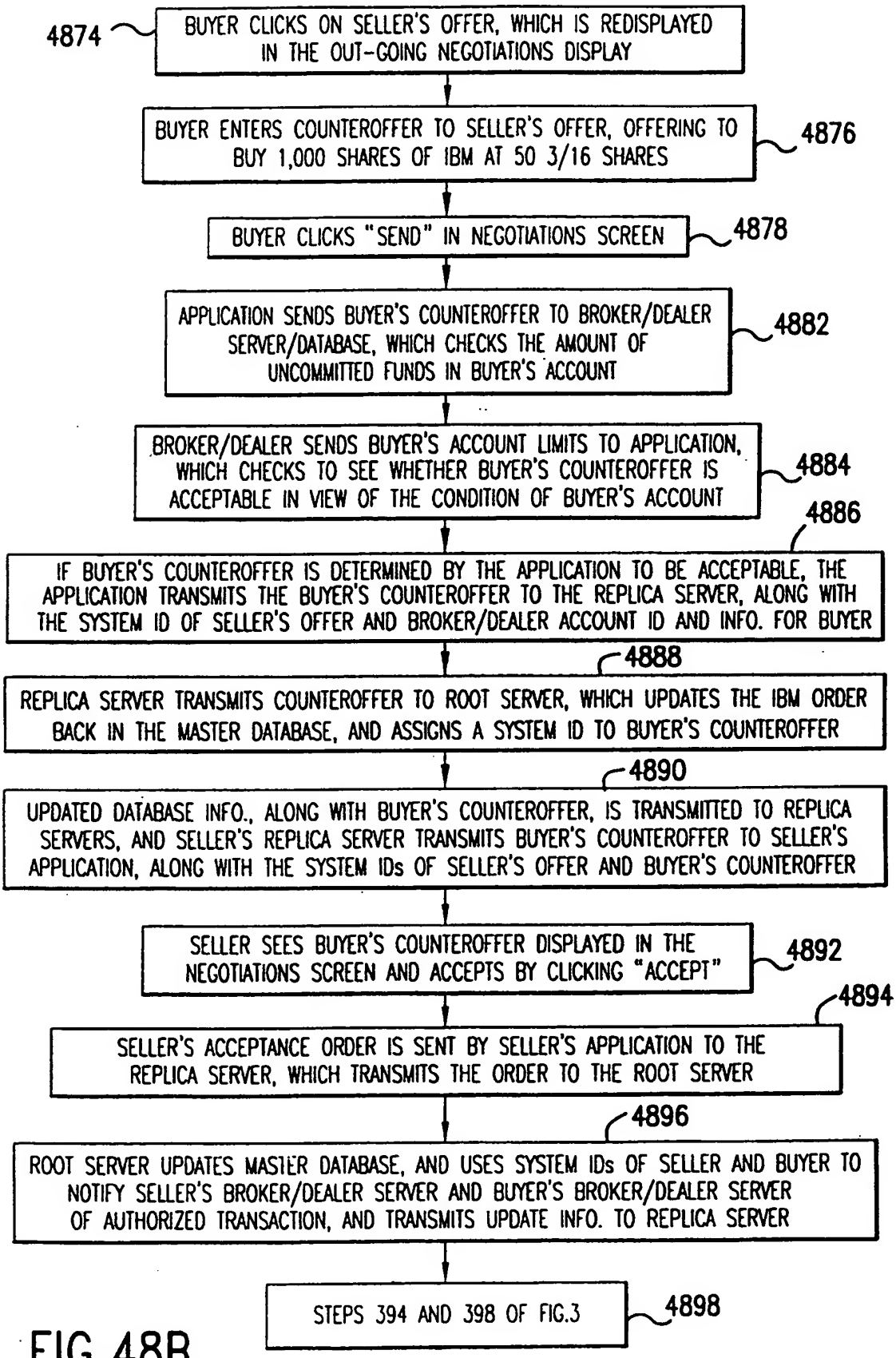

4874
BUYER CLICKS ON SELLER'S OFFER, WHICH IS REDISPLAYED IN THE OUT-GOING NEGOTIATIONS DISPLAY
BUYER ENTERS COUNTEROFFER TO SELLER'S OFFER, OFFERING TO BUY 1,000 SHARES OF IBM AT 50 3/16 SHARES
4876
BUYER CLICKS "SEND" IN NEGOTIATIONS SCREEN
4878
APPLICATION SENDS BUYER'S COUNTEROFFER TO BROKER/DEALER SERVER/DATABASE, WHICH CHECKS THE AMOUNT OF UNCOMMITTED FUNDS IN BUYER'S ACCOUNT
4882
BROKER/DEALER SENDS BUYER'S ACCOUNT LIMITS TO APPLICATION, WHICH CHECKS TO SEE WHETHER BUYER'S COUNTEROFFER IS ACCEPTABLE IN VIEW OF THE CONDITION OF BUYER'S ACCOUNT
4884
4886
IF BUYER'S COUNTEROFFER IS DETERMINED BY THE APPLICATION TO BE ACCEPTABLE, THE APPLICATION TRANSMITS THE BUYER'S COUNTEROFFER TO THE REPLICA SERVER, ALONG WITH THE SYSTEM ID OF SELLER'S OFFER AND BROKER/DEALER ACCOUNT ID AND INFO. FOR BUYER
4888
REPLICA SERVER TRANSMITS COUNTEROFFER TO ROOT SERVER, WHICH UPDATES THE IBM ORDER BACK IN THE MASTER DATABASE, AND ASSIGNS A SYSTEM ID TO BUYER'S COUNTEROFFER
4890
UPDATED DATABASE INFO., ALONG WITH BUYER'S COUNTEROFFER, IS TRANSMITTED TO REPLICA SERVERS, AND SELLER'S REPLICA SERVER TRANSMITS BUYER'S COUNTEROFFER TO SELLER'S APPLICATION, ALONG WITH THE SYSTEM IDs OF SELLER'S OFFER AND BUYER'S COUNTEROFFER
SELLER SEES BUYER'S COUNTEROFFER DISPLAYED IN THE NEGOTIATIONS SCREEN AND ACCEPTS BY CLICKING "ACCEPT"
4892
4894
SELLER'S ACCEPTANCE ORDER IS SENT BY SELLER'S APPLICATION TO THE REPLICA SERVER, WHICH TRANSMITS THE ORDER TO THE ROOT SERVER
4896
ROOT SERVER UPDATES MASTER DATABASE, AND USES SYSTEM IDs OF SELLER AND BUYER TO NOTIFY SELLER'S BROKER/DEALER SERVER AND BUYER'S BROKER/DEALER SERVER OF AUTHORIZED TRANSACTION, AND TRANSMITS UPDATE INFO. TO REPLICA SERVER
STEPS 394 AND 398 OF FIG.3
4898

FIG.48B

WEST

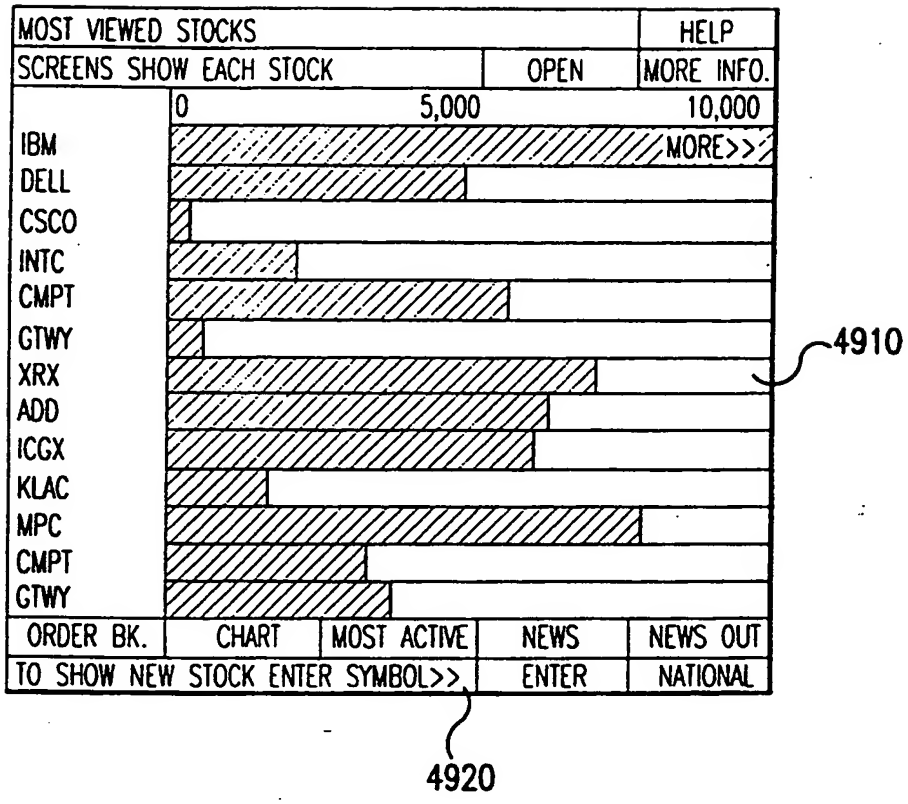

MOST VIEWED STOCKS
HELP
SCREENS SHOW EACH STOCK
OPEN
MORE INFO.
0
5,000
10,000
IBM
MORE>>
DELL
CSCO
INTC
CMPT
GTWY
XRX
ADD
ICGX
KLAC
MPC
CMPT
GTWY
ORDER BK.
CHART
MOST ACTIVE
NEWS
NEWS OUT
TO SHOW NEW STOCK ENTER SYMBOL>>
ENTER
NATIONAL
4910
4920

FIG. 49

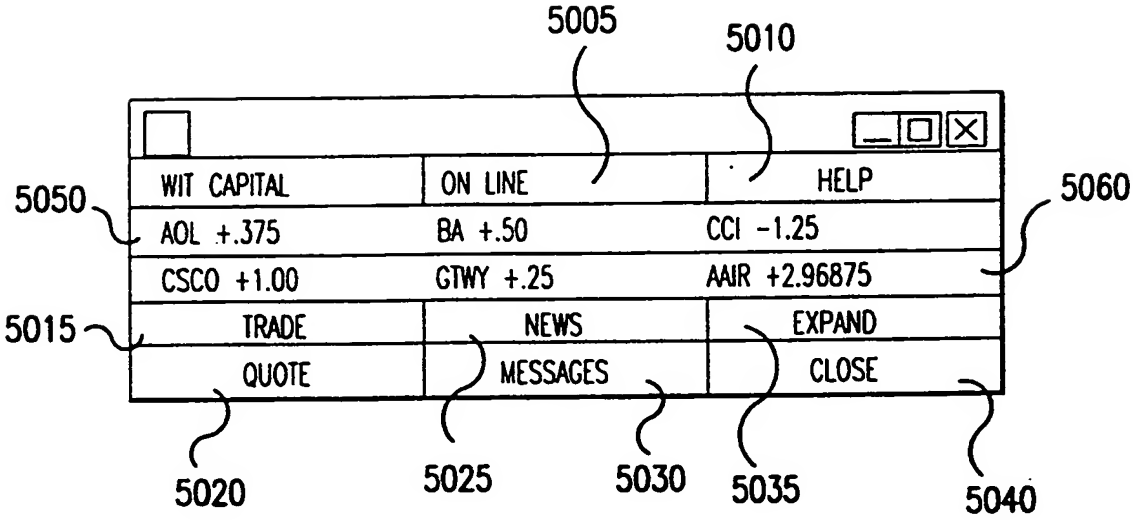

5005
5010
WIT CAPITAL
ON LINE
HELP
5050
5060
AOL +.375
BA +.50
CCI -1.25
CSCO +1.00
GTWY +.25
AAIR +2.96875
5015
TRADE
NEWS
EXPAND
QUOTE
MESSAGES
CLOSE
5020
5025
5030
5035
5040

FIG. 50

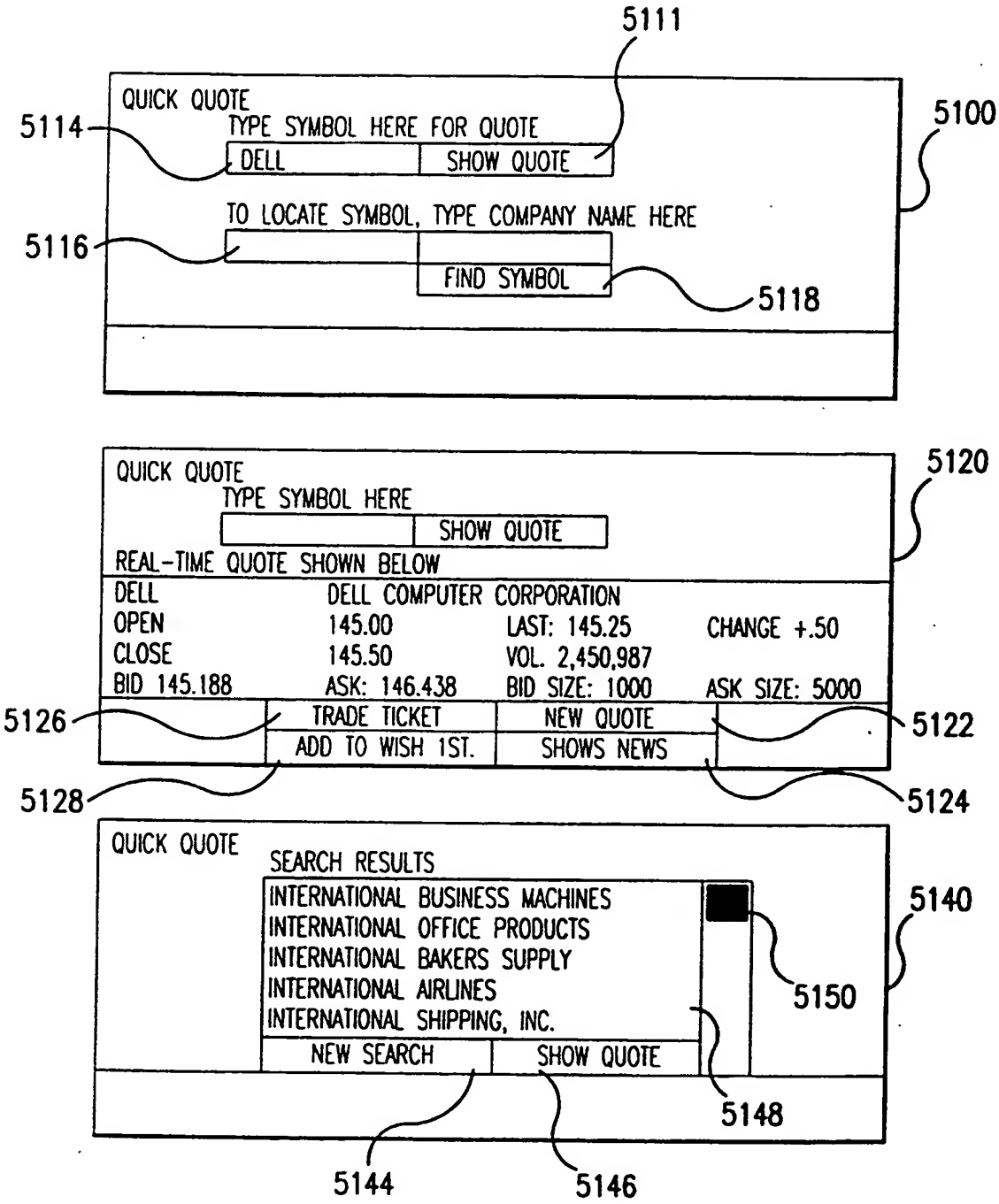

5111
QUICK QUOTE
TYPE SYMBOL HERE FOR QUOTE
5114
DELL
SHOW QUOTE
5100
TO LOCATE SYMBOL, TYPE COMPANY NAME HERE
5116
FIND SYMBOL
5118
5120
QUICK QUOTE
TYPE SYMBOL HERE
SHOW QUOTE
REAL-TIME QUOTE SHOWN BELOW
DELL
DELL COMPUTER CORPORATION
OPEN
145.00
LAST: 145.25
CHANGE +.50
CLOSE
145.50
VOL. 2,450,987
BID 145.188
ASK: 146.438
BID SIZE: 1000
ASK SIZE: 5000
5126
TRADE TICKET
NEW QUOTE
5122
ADD TO WISH 1ST.
SHOWS NEWS
5128
5124
QUICK QUOTE
SEARCH RESULTS
INTERNATIONAL BUSINESS MACHINES
INTERNATIONAL OFFICE PRODUCTS
INTERNATIONAL BAKERS SUPPLY
INTERNATIONAL AIRLINES
INTERNATIONAL SHIPPING, INC.
5140
5150
NEW SEARCH
SHOW QUOTE
5148
5144
5146

FIG. 51

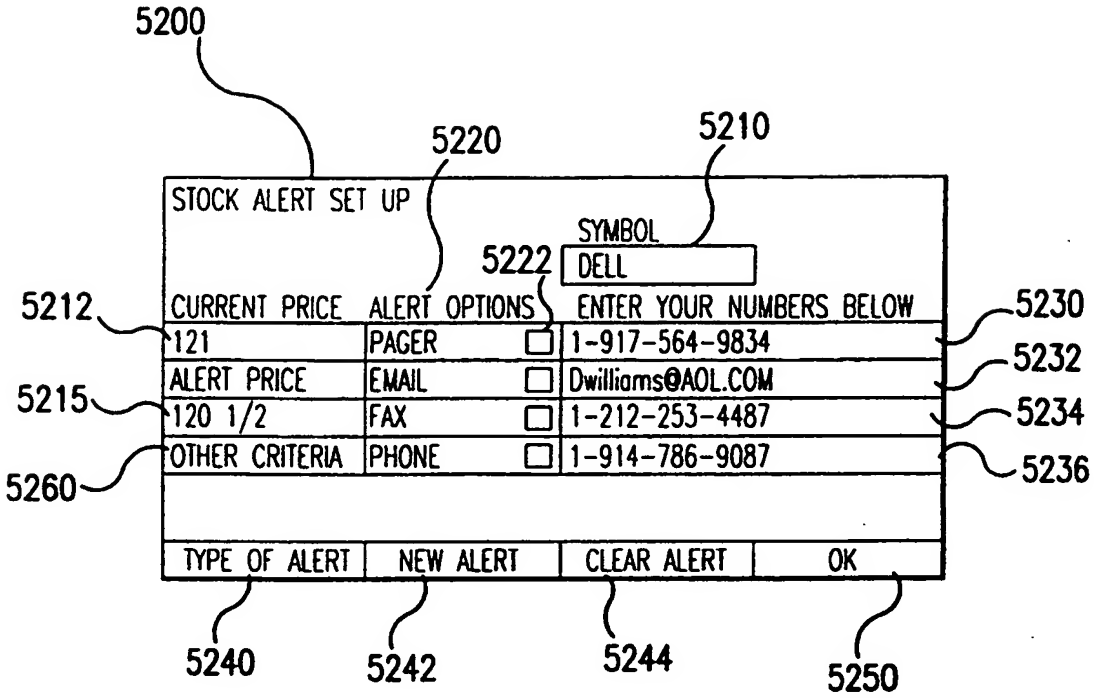

5200
5220
5210
STOCK ALERT SET UP
SYMBOL
5222
DELL
5212
CURRENT PRICE
ALERT OPTIONS
ENTER YOUR NUMBERS BELOW
5230
121
PAGER
1-917-564-9834
5232
ALERT PRICE
EMAIL
Dwilliams@AOL.COM
5215
120 1/2
FAX
1-212-253-4487
5234
OTHER CRITERIA
PHONE
1-914-786-9087
5260
5236
TYPE OF ALERT
NEW ALERT
CLEAR ALERT
OK
5240
5242
5244
5250

FIG. 52

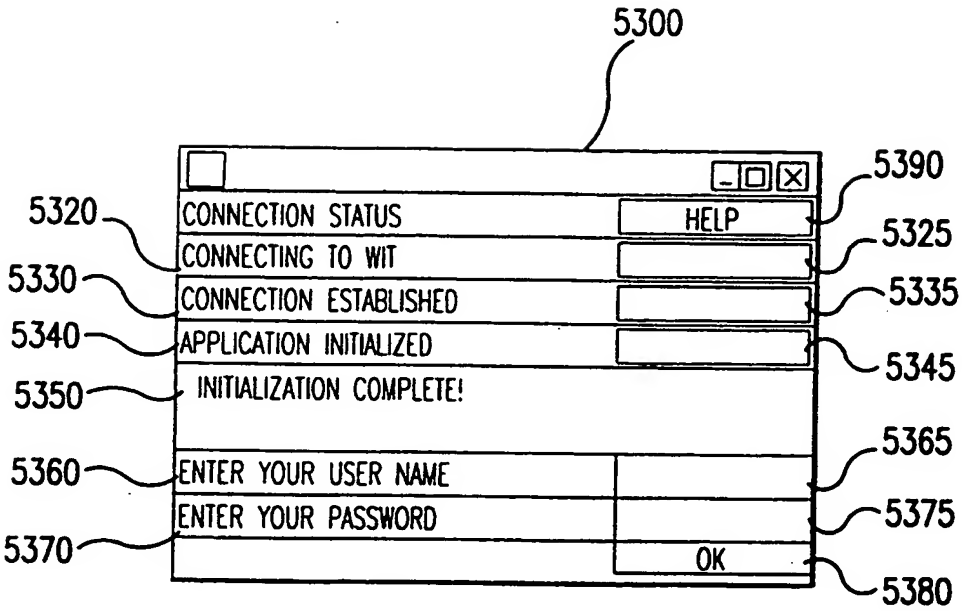

5300
5390
5320
CONNECTION STATUS
HELP
5325
5330
CONNECTING TO WIT
5335
CONNECTION ESTABLISHED
5340
APPLICATION INITIALIZED
5345
5350
INITIALIZATION COMPLETE!
5365
5360
ENTER YOUR USER NAME
5375
ENTER YOUR PASSWORD
5370
OK
5380

FIG. 53

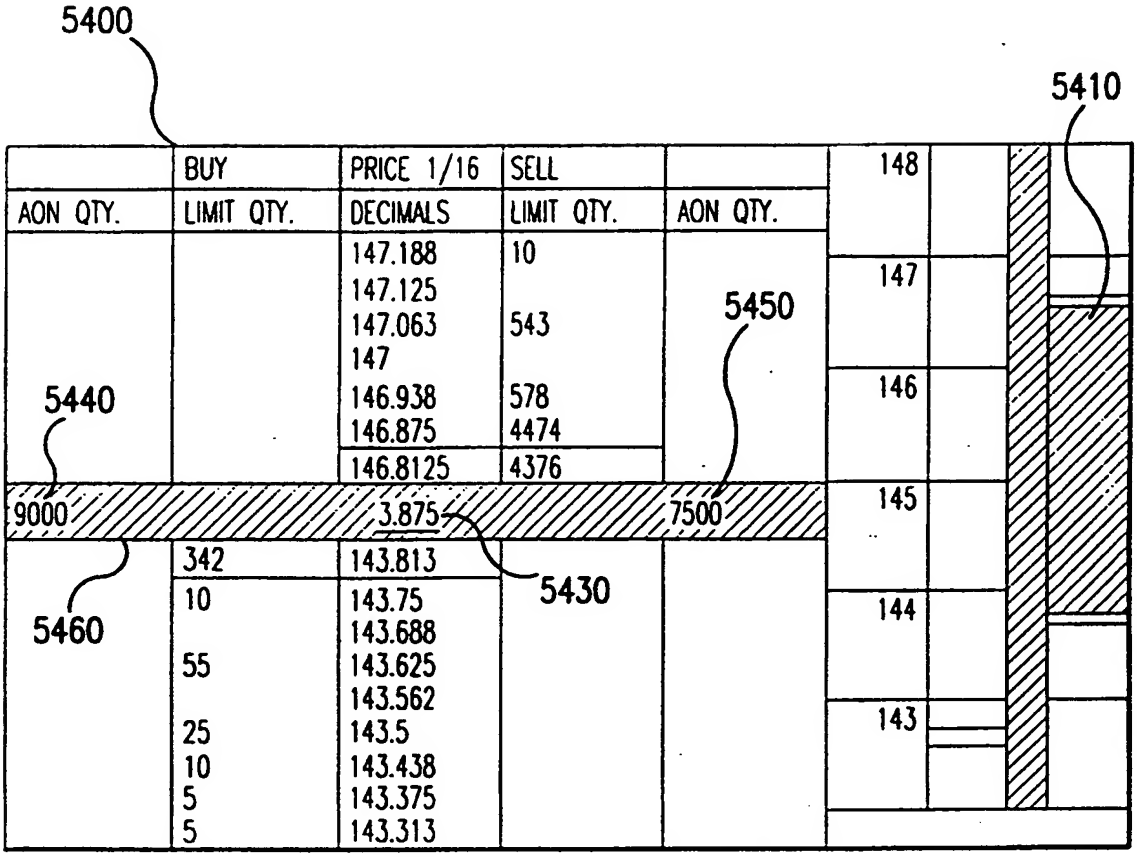

5400
5410
BUY
PRICE 1/16
SELL
AON QTY.
LIMIT QTY.
DECIMALS
LIMIT QTY.
AON QTY.
147.188
147.125
147.063
147
146.938
146.875
146.8125
10
543
578
4474
4376
5450
5440
148
147
146
145
144
143
9000
3.875
7500
342
143.813
10
143.75
143.688
55
143.625
143.562
25
143.5
10
143.438
5
143.375
5
143.313
5430
5460

FIG. 54

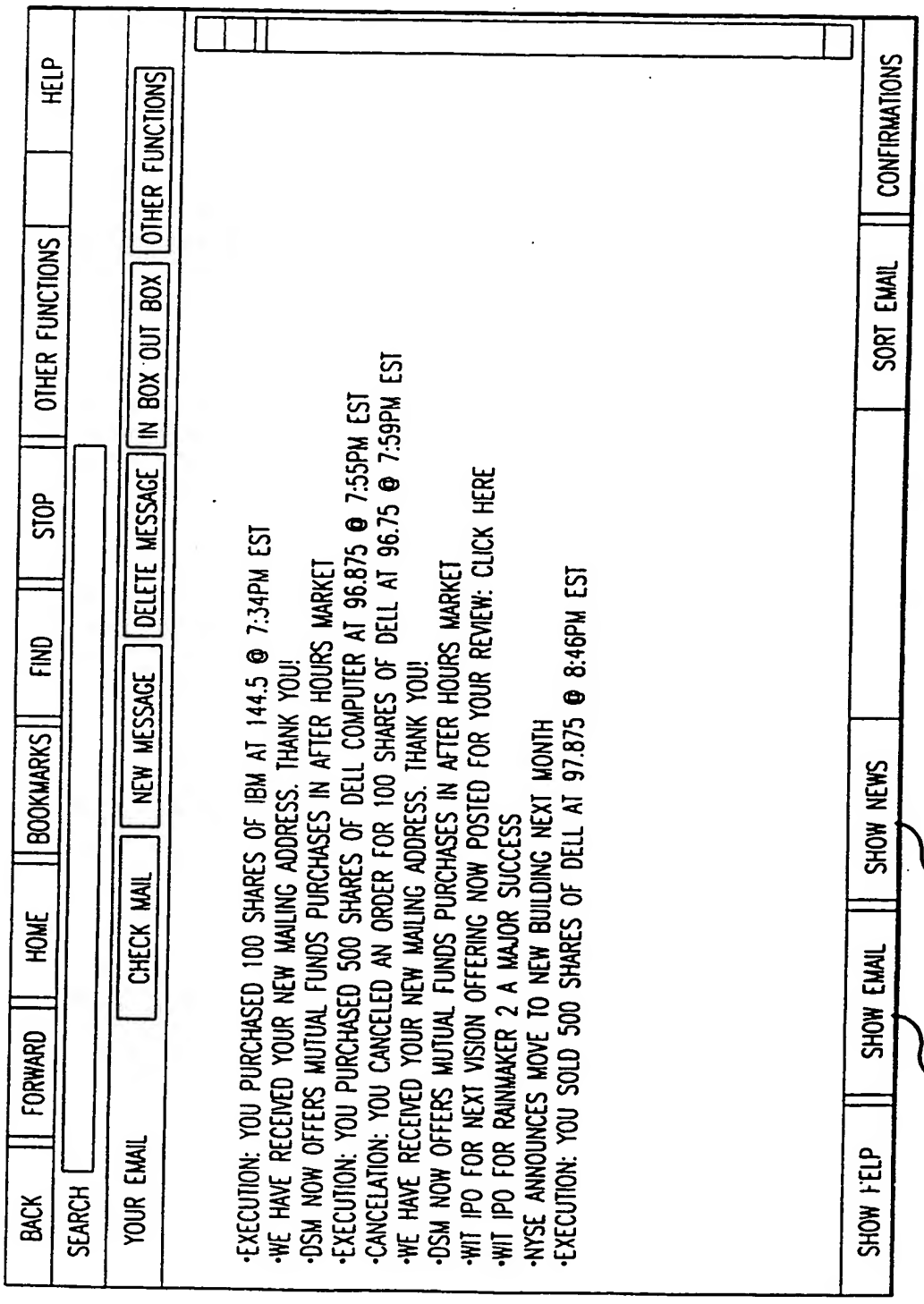

BACK
FORWARD
HOME
BOOKMARKS
FIND
STOP
OTHER FUNCTIONS
HELP
SEARCH
YOUR EMAIL
CHECK MAIL
NEW MESSAGE
DELETE MESSAGE
IN BOX OUT BOX
OTHER FUNCTIONS
•EXECUTION: YOU PURCHASED 100 SHARES OF IBM AT 144.5 @ 7:34PM EST
•WE HAVE RECEIVED YOUR NEW MAILING ADDRESS. THANK YOU!
•DSM NOW OFFERS MUTUAL FUNDS PURCHASES IN AFTER HOURS MARKET
•EXECUTION: YOU PURCHASED 500 SHARES OF DELL COMPUTER AT 96.875 @ 7:55PM EST
•CANCELATION: YOU CANCELED AN ORDER FOR 100 SHARES OF DELL AT 96.75 @ 7:59PM EST
•WE HAVE RECEIVED YOUR NEW MAILING ADDRESS. THANK YOU!
•DSM NOW OFFERS MUTUAL FUNDS PURCHASES IN AFTER HOURS MARKET
•WIT IPO FOR NEXT VISION OFFERING NOW POSTED FOR YOUR REVIEW: CLICK HERE
•WIT IPO FOR RAINMAKER 2 A MAJOR SUCCESS
•NYSE ANNOUNCES MOVE TO NEW BUILDING NEXT MONTH
•EXECUTION: YOU SOLD 500 SHARES OF DELL AT 97.875 @ 8:46PM EST
SHOW HELP
SHOW EMAIL
SHOW NEWS
SORT EMAIL
CONFIRMATIONS
5510
5520

FIG. 55

5610

FINAL VERIFICATION			
BUY ORDER: DELL COMPUTER NATIONAL MARKET THIS IS FINAL VERIFICATION THAT YOU WISH TO EXECUTE THIS TRADE. PLEASE NOTE THE FINAL REAL-TIME QUOTE SHOWN BELOW.			
ACTION	QUANTITY	SYMBOL	PRICE TYPE
BUY	1000	DELL	STOP/LIMIT
LIMIT PRICE	STOP PRICE		REF. 4539
145.438	145.5		
DURATION	CONDITION	ACCOUNT	ROUTE
DAY	AON	CASH	NATIONAL
REAL-TIME QUOTE SHOWN BELOW			
OPEN	145.00	LAST: 145.25	CHANGE +.50
CLOSE	145.50	VOL.2,450,987	
BID 145.188	ASK: 146.438	BID SIZE: 1000	ASK SIZE: 5000
YOUR CURRENT BUYING POWER IS:			$156,876.99
IF YOU EXECUTE THIS TRADE YOUR BALANCE WILL BE:			$136,876.54
IF YOU EXECUTE THIS TRADE YOUR COMMISSION WILL BE:			$76.54
THE TOTAL COST INCLUDING COMMISSION WILL BE:			$20,076.99
	SHOW DSM	CANCEL	SEND
	CLEAR	HIDE DETAILS	

5640 5650 5620 5670 5630

FIG. 56

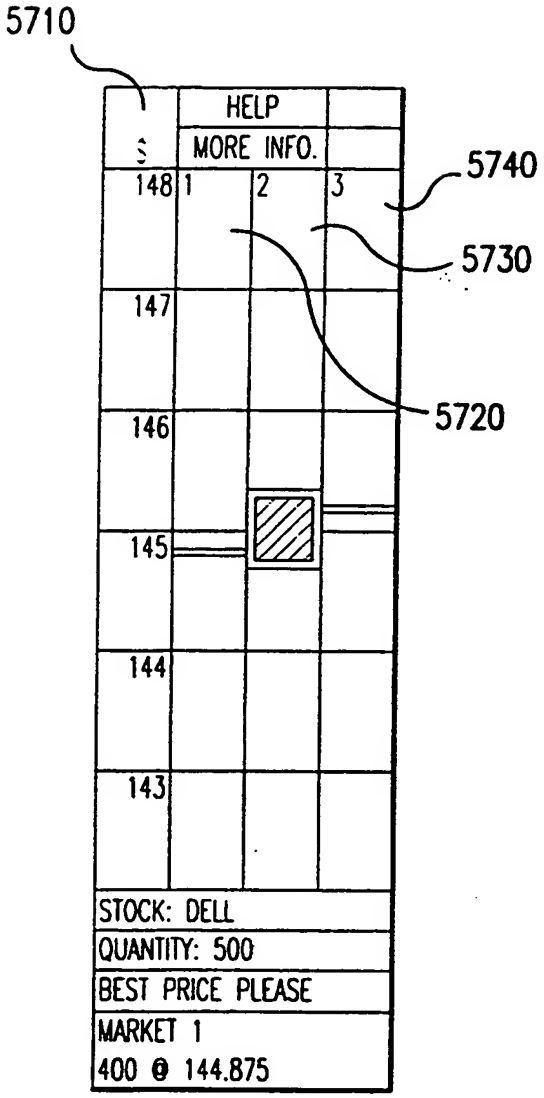

5710
HELP
MORE INFO.
148
1
2
3
147
146
145
144
143
5740
5730
5720
STOCK: DELL
QUANTITY: 500
BEST PRICE PLEASE
MARKET 1
400 @ 144.875

FIG. 57

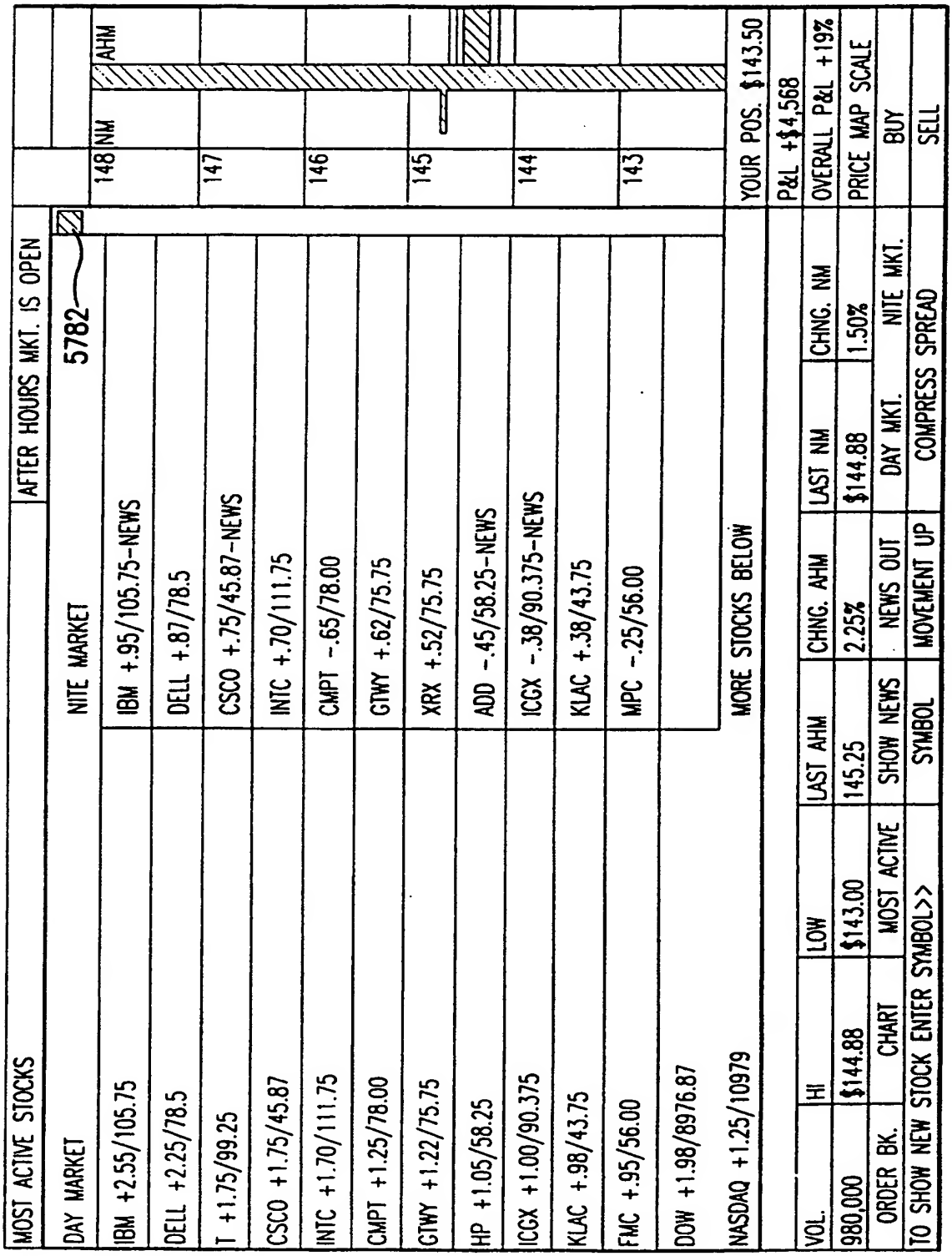

MOST ACTIVE STOCKS
AFTER HOURS MKT. IS OPEN
DAY MARKET
NITE MARKET
5782
148
NM
AHM
147
146
145
144
143
IBM +2.55/105.75
DELL +2.25/78.5
T +1.75/99.25
CSCO +1.75/45.87
INTC +1.70/111.75
CMPT +1.25/78.00
GTWY +1.22/75.75
HP +1.05/58.25
ICGX +1.00/90.375
KLAC +.98/43.75
FMC +.95/56.00
DOW +1.98/8976.87
NASDAQ +1.25/10979
IBM +.95/105.75-NEWS
DELL +.87/78.5
CSCO +.75/45.87-NEWS
INTC +.70/111.75
CMPT -.65/78.00
GTWY +.62/75.75
XRX +.52/75.75
ADD -.45/58.25-NEWS
ICGX -.38/90.375-NEWS
KLAC +.38/43.75
MPC -.25/56.00
MORE STOCKS BELOW
YOUR POS. $143.50
P&L +$4,568
OVERALL P&L +19%
PRICE MAP SCALE
BUY
SELL
VOL.
HI
LOW
LAST AHM
CHNG. AHM
LAST NM
CHNG. NM
980,000
$144.88
$143.00
145.25
2.25%
$144.88
1.50%
ORDER BK.
CHART
MOST ACTIVE
SHOW NEWS
NEWS OUT
DAY MKT.
NITE MKT.
TO SHOW NEW STOCK ENTER SYMBOL>>
SYMBOL
MOVEMENT UP
COMPRESS SPREAD

FIG.57A

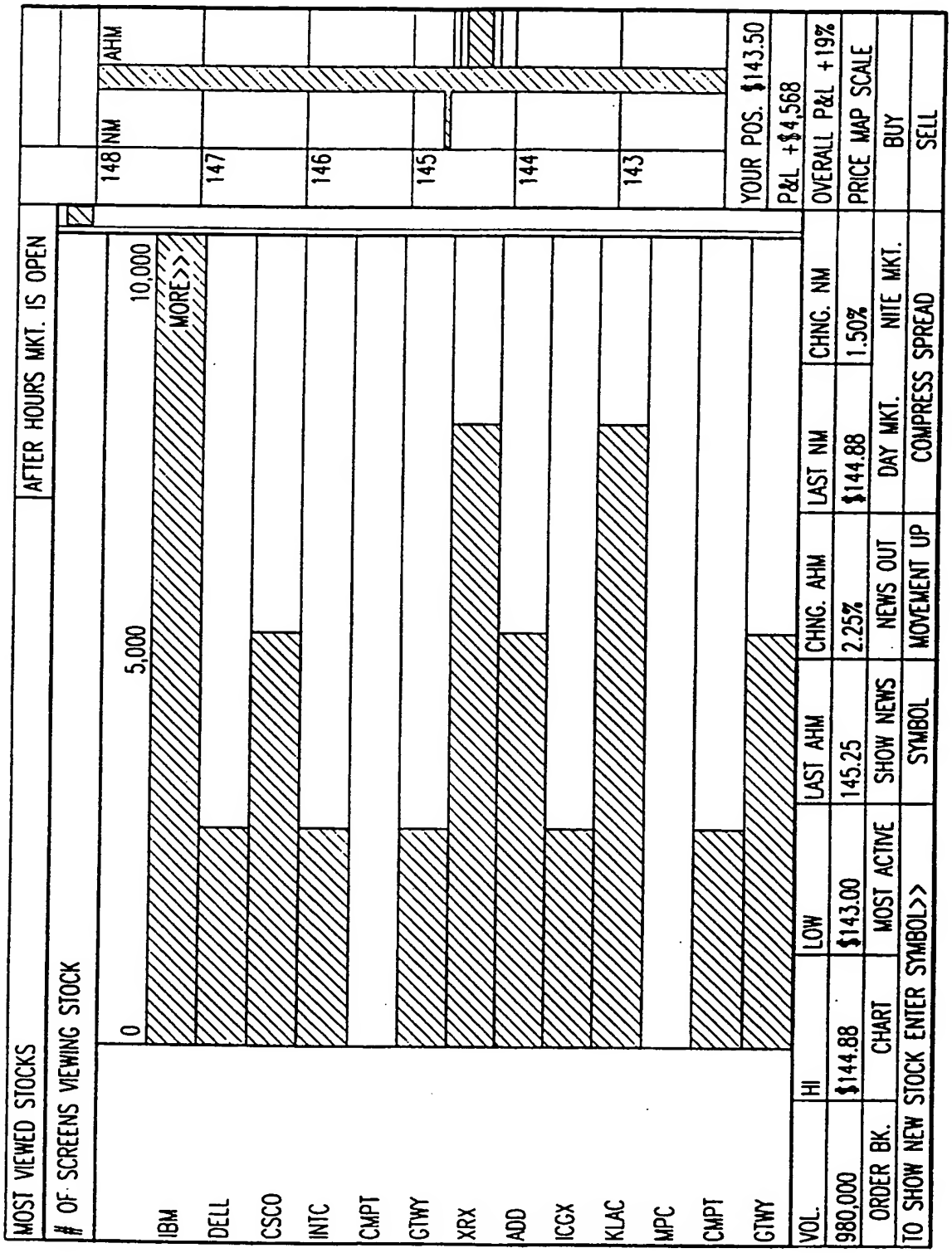
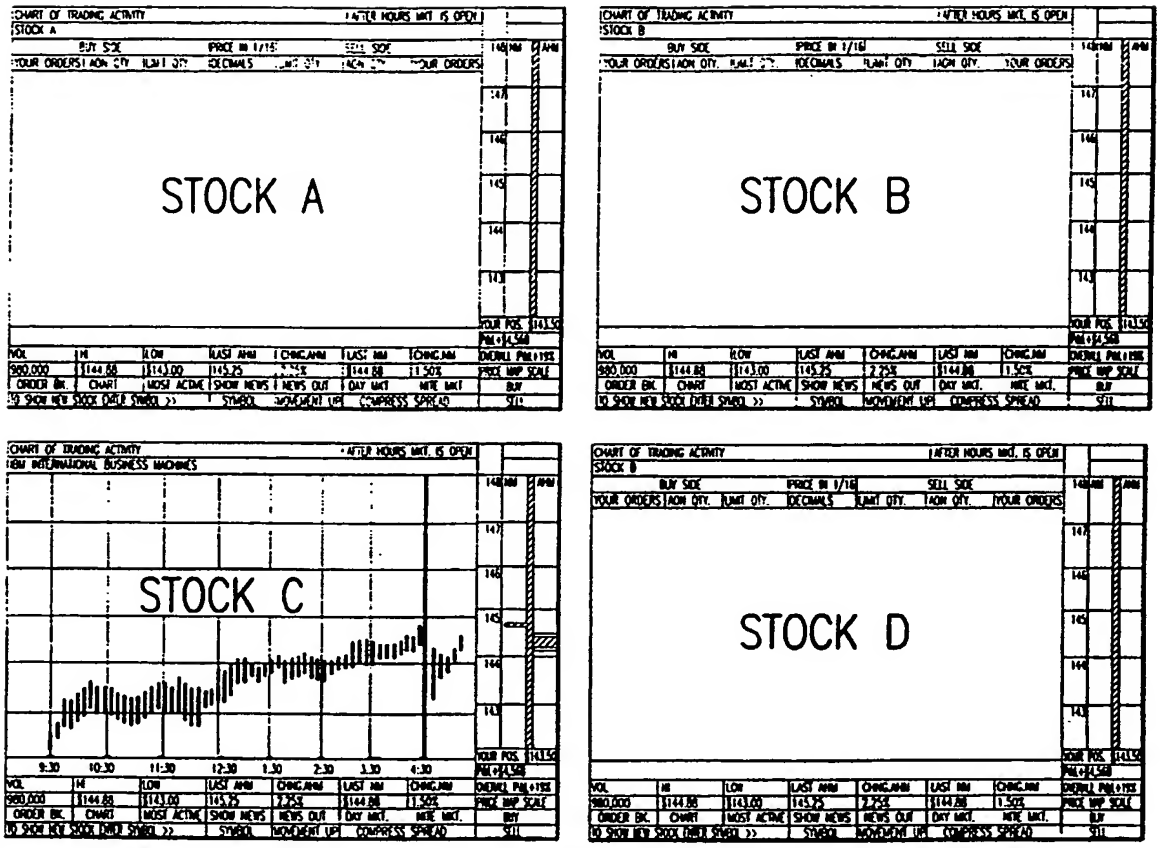

MOST VIEWED STOCKS
AFTER HOURS MKT. IS OPEN
OF SCREENS VIEWING STOCK
0
5,000
10,000
MORE>>
IBM
DELL
CSCO
INTC
CMPT
GTWY
XRX
ADD
ICGX
KLAC
MPC
CMPT
GTWY
148 NM
147
146
145
144
143
AHM
YOUR POS. $143.50
P&L +$4,568
OVERALL P&L +19%
PRICE MAP SCALE
BUY
SELL
VOL.
HI
LOW
LAST AHM
CHNG. AHM
LAST NM
CHNG. NM
980,000
$144.88
$143.00
145.25
2.25%
$144.88
1.50%
ORDER BK.
CHART
MOST ACTIVE
SHOW NEWS
NEWS OUT
DAY MKT.
NITE MKT.
TO SHOW NEW STOCK ENTER SYMBOL>>
SYMBOL
MOVEMENT UP
COMPRESS SPREAD

FIG.57B



WIT CAPITAL						PREFERENCES	HELP
ON-LINE	SENT			RECEIVED AT WIT		REF: 3467	9:32:00 AM EST
	QWST +1	FDE +87	HGB +76	UHJ +78	GTWY +.15	NTSC +.75	MORE ABOVE
WIT 25+ 1.89	DELL +2	FWT -.75	GPM +6	PRD +.55	DEF +.88	FRX -4.5	MORE BELOW
WATCH STKS. +34	ICGX -5.5	APPL +3.5	AMAT +.12	CMPT +.75	PGEX -3	PXD +.55	DJIA +.65
YOUR STKS. +87	KLAC +.5	USSB +3.75	GM -.76	RAND -.55	QWST +1	COR +.75	NASDAQ +.09
TRADE STOCKS	POS./BAL.	P&L HISTORY	SUMMARY	NEWS SITES	WIT NEWS	IPO INFO.	EXPAND
QUICK QUOTE	OPEN ORDERS	NEGOTIATIONS	VIEW E-MAIL	WEB WINDOW	PEEL OFF DISPLAY	OTHER FUNCTIONS	SHRINK

FIG.57C

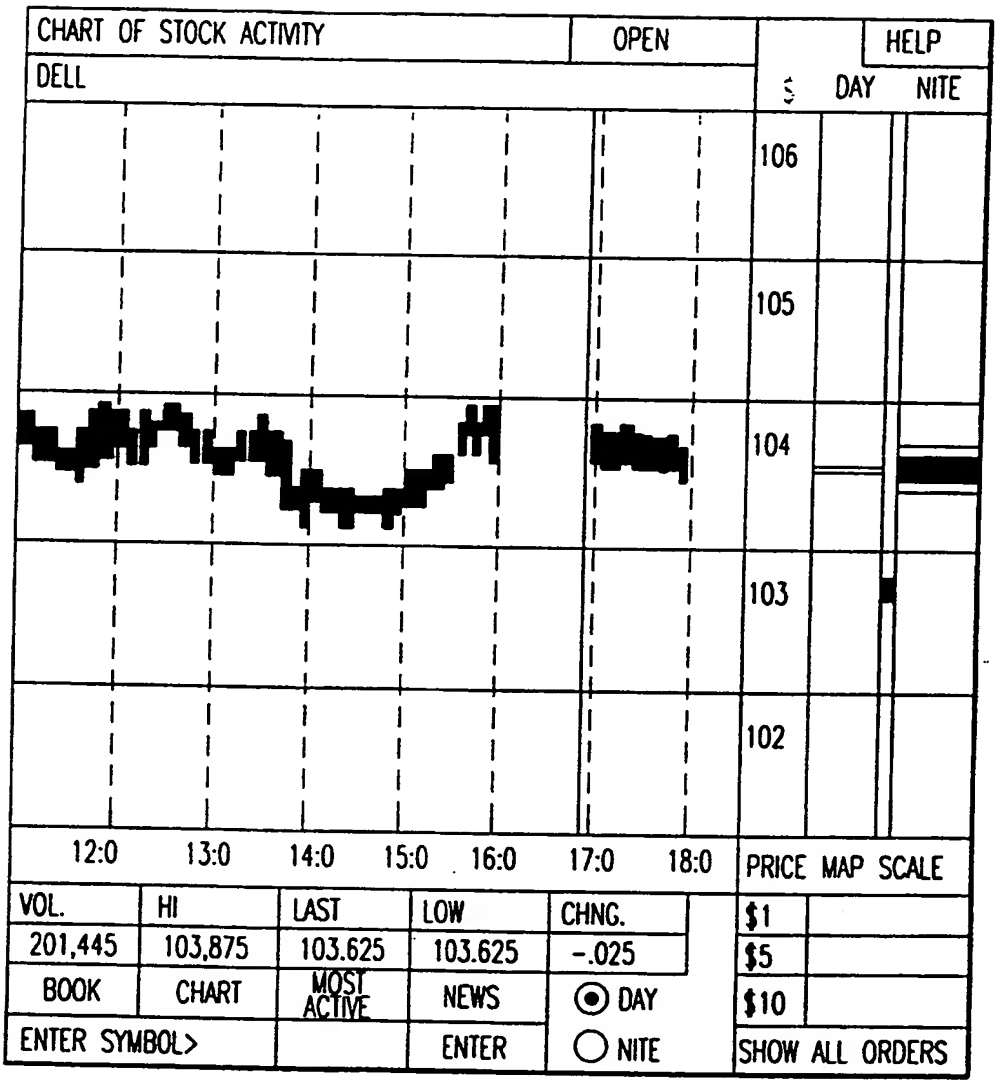


CHART OF STOCK ACTIVITY
OPEN
HELP
DELL
$
DAY
NITE
106
105
104
103
102
12:0
13:0
14:0
15:0
16:0
17:0
18:0
PRICE MAP SCALE
VOL.
HI
LAST
LOW
CHNG.
201,445
103,875
103.625
103.625
-.025
BOOK
CHART
MOST ACTIVE
NEWS
DAY
NITE
ENTER SYMBOL>
ENTER
$1
$5
$10
SHOW ALL ORDERS

FIG. 58

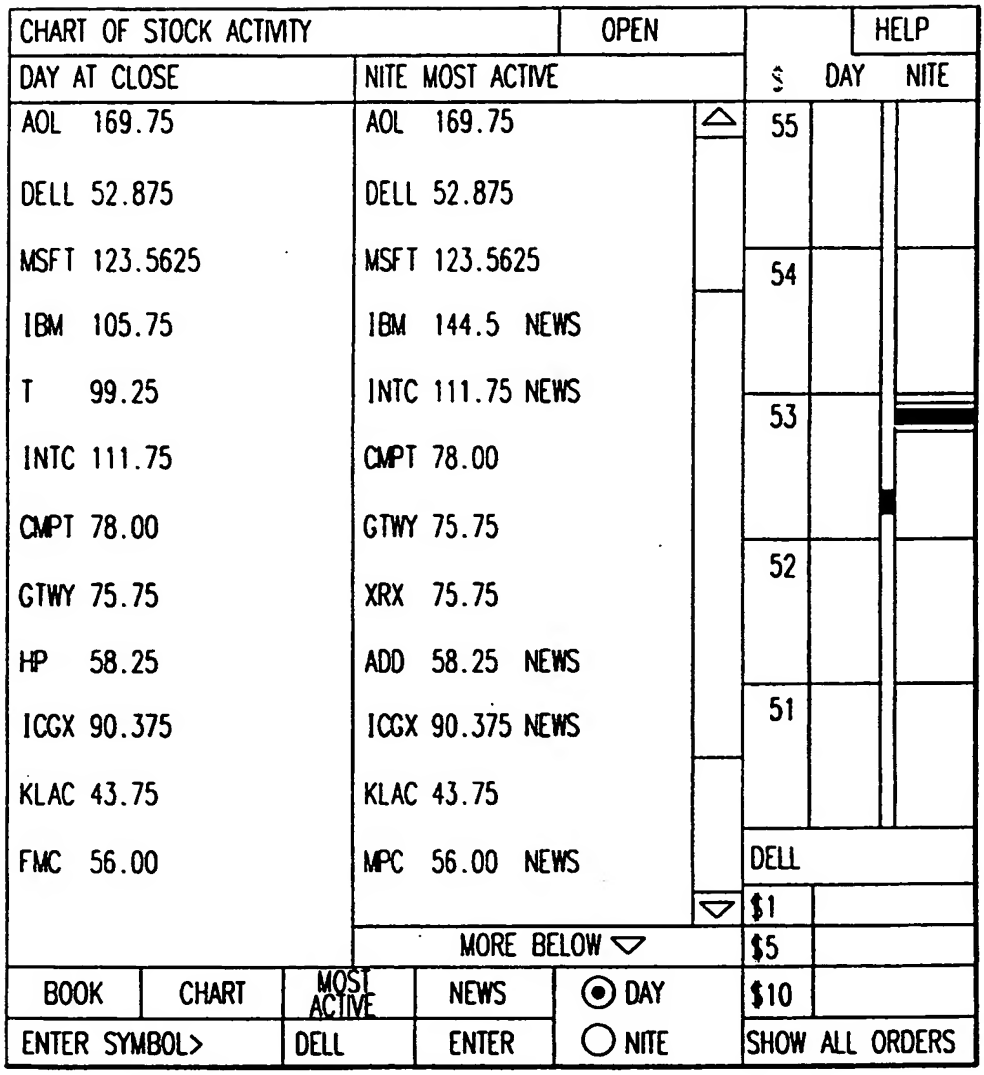


CHART OF STOCK ACTIVITY
OPEN
HELP
DAY AT CLOSE
NITE MOST ACTIVE
$
DAY
NITE
AOL 169.75
DELL 52.875
MSFT 123.5625
IBM 105.75
T 99.25
INTC 111.75
CMPT 78.00
GTWY 75.75
HP 58.25
ICGX 90.375
KLAC 43.75
FMC 56.00
AOL 169.75
DELL 52.875
MSFT 123.5625
IBM 144.5 NEWS
INTC 111.75 NEWS
CMPT 78.00
GTWY 75.75
XRX 75.75
ADD 58.25 NEWS
ICGX 90.375 NEWS
KLAC 43.75
MPC 56.00 NEWS
MORE BELOW
55
54
53
52
51
DELL
$1
$5
$10
BOOK
CHART
MOST ACTIVE
NEWS
DAY
NITE
SHOW ALL ORDERS
ENTER SYMBOL>
DELL
ENTER

FIG.59

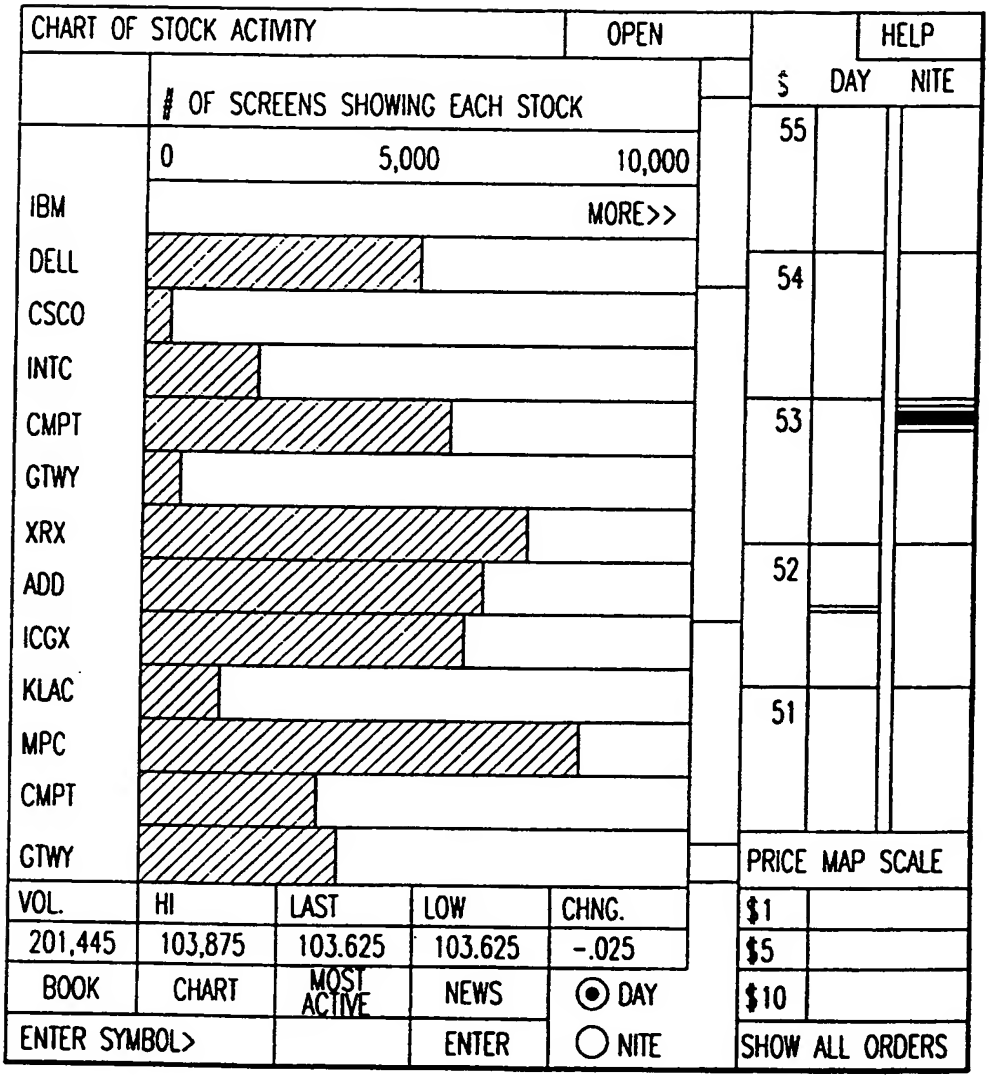


CHART OF STOCK ACTIVITY
OPEN
HELP
OF SCREENS SHOWING EACH STOCK
$
DAY
NITE
0
5,000
10,000
55
MORE>>
IBM
DELL
54
CSCO
INTC
CMPT
53
GTWY
XRX
ADD
52
ICGX
KLAC
51
MPC
CMPT
GTWY
PRICE MAP SCALE
VOL.
HI
LAST
LOW
CHNG.
$1
201,445
103.875
103.625
103.625
-.025
$5
BOOK
CHART
MOST ACTIVE
NEWS
DAY
$10
ENTER SYMBOL>
ENTER
NITE
SHOW ALL ORDERS

FIG.60

AFTER HOURS ORDER BOOK			OPEN			HELP
DELL						$ DAY NITE
BUY AON	BUY LIMIT	PRICE 1/16	SELL LIMIT	SELL AON		55
		53	100	500		
		52.9375	500	1000		
		52.875	400	500		54
		52.8125	400			
	100	52.75				
		52.6875				53
	100	52.625				
	100	52.562				
		52.5				
		52.4375				52
	800	52.375				
		52.3125				
	100	52.25				51
		52.1875				
	400	52.125				
		52.0625				
	200	52				PRICE MAP SCALE
VOL.	HI	LAST	LOW	CHNG.		$1
1,000	53	51.625	51.625	-.0625		$5
BOOK	CHART	MOST ACTIVE	NEWS	◉ DAY		$10
ENTER SYMBOL>		DELL	ENTER	○ NITE		SHOW ALL ORDERS

FIG.61

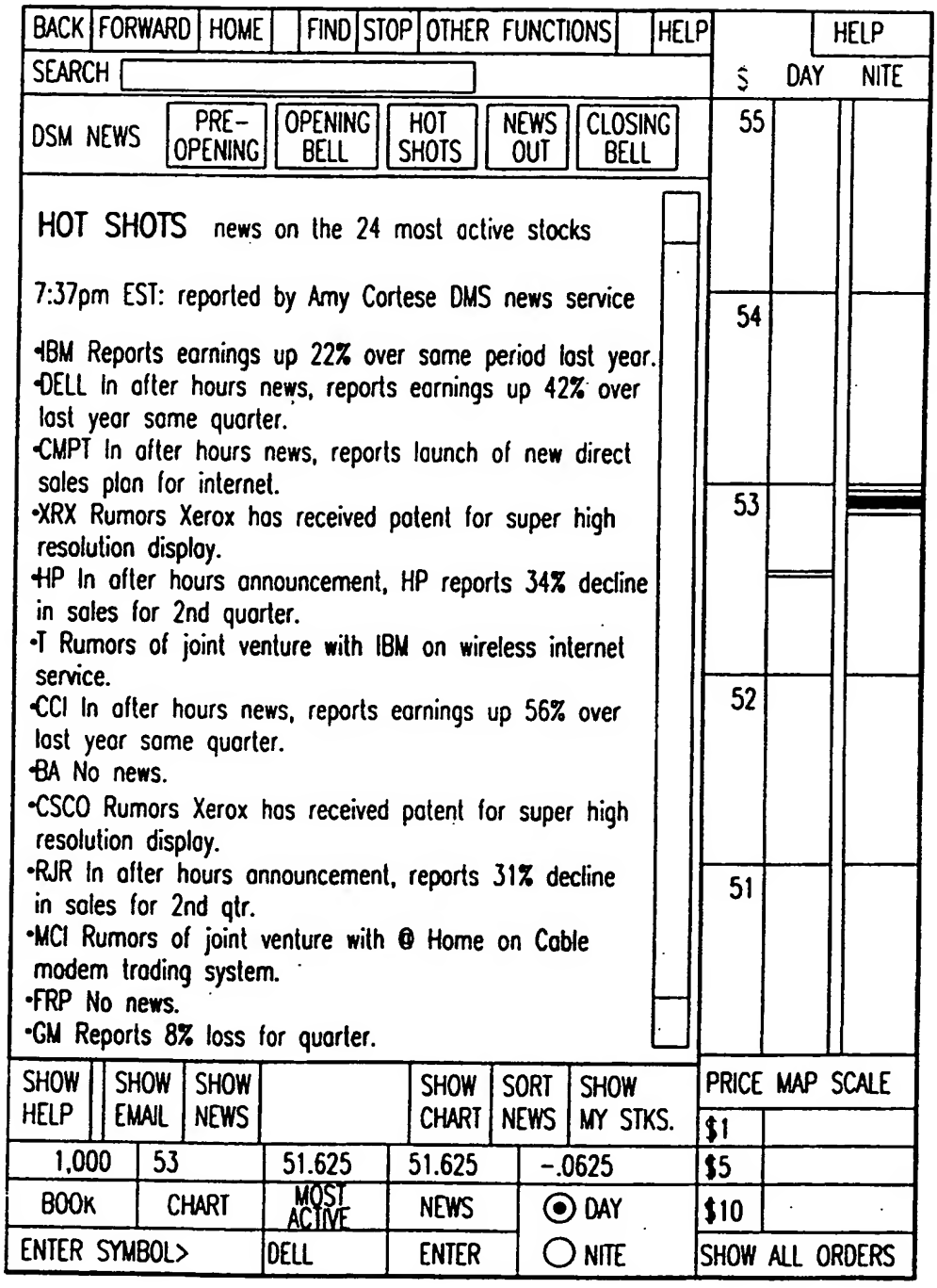

BACK
FORWARD
HOME
FIND
STOP
OTHER FUNCTIONS
HELP
SEARCH
HELP
$
DAY
NITE
DSM NEWS
PRE-OPENING
OPENING BELL
HOT SHOTS
NEWS OUT
CLOSING BELL
55
54
53
52
51
HOT SHOTS news on the 24 most active stocks
7:37pm EST: reported by Amy Cortese DMS news service
•IBM Reports earnings up 22% over same period last year.
•DELL In after hours news, reports earnings up 42% over last year same quarter.
•CMPT In after hours news, reports launch of new direct sales plan for internet.
•XRX Rumors Xerox has received patent for super high resolution display.
•HP In after hours announcement, HP reports 34% decline in sales for 2nd quarter.
•T Rumors of joint venture with IBM on wireless internet service.
•CCI In after hours news, reports earnings up 56% over last year same quarter.
•BA No news.
•CSCO Rumors Xerox has received patent for super high resolution display.
•RJR In after hours announcement, reports 31% decline in sales for 2nd qtr.
•MCI Rumors of joint venture with @ Home on Cable modem trading system.
•FRP No news.
•GM Reports 8% loss for quarter.
SHOW HELP
SHOW EMAIL
SHOW NEWS
SHOW CHART
SORT NEWS
SHOW MY STKS.
PRICE MAP SCALE
$1
1,000
53
51.625
51.625
-.0625
$5
BOOK
CHART
MOST ACTIVE
NEWS
DAY
$10
ENTER SYMBOL>
DELL
ENTER
NITE
SHOW ALL ORDERS

FIG.62

INTERNATIONAL SEARCH REP RT

International application No.
PCT/US00/05150

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) :G06F 17/60, 17/00
US CL : 705/35, 37, 39; 709/203
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 705/35 37,39; 709/203

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WEST, EAST, STN ONLINE DIALOG, IEEE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,809,483 A (BROKA et al) 15 September 1998, see entire document.	1-21
Y,P	US 5,950,177 A (LUPIEN et al) 07 September 1999, see entire document.	1-21

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 09 APRIL 2000	Date of mailing of the international search report 25 APR 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ALLEN MACDONALD James R. Matthews Telephone No. (703) 305-9708

Form PCT/ISA/210 (second sheet) (July 1998)*